Vol. 1042 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

May 29, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 29, 1984 Volume 1042 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,275,662, Re. S.N. 587,507, Filed Mar. 8, 1984, Cl. 105/377, RAILWAY HOPPER CAR ROOF SUPPORT STRUCTURE, Franklin P. Adler, et al., Owner of Record: *Richmond Tank Car Co., Houston Tex.*, Attorney or Agent: Lester L Hewitt, Ex. Gp.: 312

4,412,621, Re. S.N. 589,483, Filed Mar. 14, 1984, Cl. 211/58, MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS AND THE LIKE, Falk-Jurgen Eichner, Owner of Record: *Fellow Manufacturing Co., Itasca, Ill.*, Attorney or Agent: Talivaldis Cepuritis, Ex. Gp.: 355

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Service by Publication

A petition to cancel the registration listed below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assignee or legal representative, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Basila Mfg. Co., Inc., Leakesville, Miss., Reg. No. 583,188, for the mark "BASILA" and design, Canc. No. 14,000.

ERMA S. BROWN,
Deputy Clerk, Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Subscription Pricing Information

The annual subscription prices on the following publication have been changed as indicated below:

Title:	Patent and Trademark Office Notices	
	First-class domestic mailing	$ 71.00
	First-class foreign mailing	not available
	Third-class domestic mailing	57.00
	Third-class foreign mailing	71.25

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer 1984.

Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

May 7, 1984.

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227–18]
Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce

Action: Final rule: Change of effective date

Summary: The Patent and Trademark Office amended the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing by publishing a notice in the Federal Register on Apr. 4, 1984, at 49 Fed. Reg. 13456–

13463. The notice set an effective date of June 1, 1984. However, title 35, United States Code, section 41(g) provides that "No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register." Since these rules establish fees and the effective date of the rules was slightly less than 60 days after the publication of the final rule change in the Federal Register, it is necessary to set a later effective date.

Date: The effective date of the rule change published at 49 Fed. Reg. 13456–13463 is changed to June 4, 1984.

For further information contact: Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

GERALD J. MOSSINGHOFF,
Apr. 30, 1984. *Commissioner of Patents and Trademarks.*

USTA Publication of Looseleaf Rules of Practice

The United States Trademark Association has published *US Trademark Law: Rules of Practice, Forms and Federal Statutes.* The book, in looseleaf format to allow for supplements, includes the trademark Rules of Practice, sample forms, the Lanham Act and applicable provisions and cites of other statutes that deal with trademarks and the Patent and Trademark Office. In content and format, the USTA publication generally replaces the Government Printing Office looseleaf edition of the Rules of Practice which has been discontinued.

Information on ordering copies of *US Trademark Law: Rules of Practice, Forms and Federal Statutes* may be obtained from:

The United States Trademark Association
6 East 45th Street
New York, N.Y. 10017
(212) 986-5880

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, every July. Effective July 1, 1983, however, the CFR edition no longer includes forms.

MARGARET M. LAURENCE,
Apr. 30, 1984. *Assistant Commissioner for Trademark.*

U.S. Government-Owned Inventions

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Patent Licensing.
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

Department of Agriculture

SN 6-276,764 (4,432,147). ENERGY EFFICIENT LUMBER DRY KILN USING SOLAR COLLECTORS AND REFRIGERATION SYSTEM.
SN 6-352,662 (4,439,488). ENCAPSULATION BY ENTRAPMENT WITHIN POLYHYDROXY POLYMER BORATES.
SN 6-500,043. SDL-POP-S-1, A NEW BIOTYPE OF PSEUDOMONAS CEPACIA.
SN 6-570,155. MONOCLONAL ANTIBODIES TO BLUETONGUE VIRUS ANTIGEN.
SN 6-579,919. CONTINUOUS TREE HARVESTER.
SN 6-586,617. PROCESS TO IMPART SMOOTH-DRY AND FLAME RETARDANT PROPERTIES TO CELLULOSIC FABRIC.
SN 6-591,367. METHOD FOR CONTROLLING YELLOW NUTSEDGE USING PUCCINIA CANALICULATA.

Department of Commerce

SN 6-346,314 (4,433,336). THREE-ELEMENT ANTENNA FORMED OF ORTHOGONAL LOOPS MOUNTED ON A MONOPOLE.
SN 6-581,831. FLEXURE HINGE.

Department of Health & Human Services

SN 6-602,946. METHOD OF CONTINUOUS PRODUCTION OF RETROVIRUSES (HTLV-III) FROM PATIENTS WITH AIDS AND PRE-AIDS.
SN 6-602,945. SEROLOGICAL DETECTION OF ANTIBODIES TO HTLV-III IN SERA OF PATIENTS WITH AIDS AND PRE-AIDS CONDITIONS.
SN 6-181,954 (4,430,437). TEST METHODS EMPLOYING MONOCLONAL ANTIBODIES AGAINST HERPES SIMPLEX VIRUS TYPES 1 AND 2 NUCLEOCAPSIDS PROTEINS.
SN 6-210,044 (4,433,400). ACOUSTICALLY TRANSPARENT HYDROPHONE PROBE.
SN 6-22,219 (4,437,857). METHOD AND APPARATUS FOR TRAVERSING BLOOD VESSELS.
SN 6-243,775 (4,435,572). SYNTHESIS OF ETHYL-4(3'-METHOXYPHENYL)-1-METHYL PIPERIDINE-3-CARBOXYLATE.
SN 6-307,536 (4,430,318). IMMUNOASSAY UTILIZING 125I PROTEIN A.
SN 6-343,026 (4,438,098). HEAT TREATMENT OF A NON-A, NON-B HEPATITIS AGENT TO PREPARE A VACCINE.
SN 6-416,107 (4,430,216). HIGH SPEED PREPARATIVE COUNTERCURRENT CHROMATOGRAPHY WITH A MULTIPLE LAYER COILED COLUMN.
SN 6-426,141 (4,435,505). LYSIS FILTRATION CULTURE CHAMBER.
SN 6-555,811. RECOMBINANT VACCINES FOR INFLUENZA VIRUS AND HEPATITIS B VIRUS.
SN 6-564,411. INDIUM-BLEOMYCIN COMPLEX (111 IN-BLMC).
SN 6-577,817. ANTITUSSIVE 6-KETO MORPHINANS OF THE (+)-SERIES.

Department of the Air Force

SN 6-227,319 (4,426,193). IMPACT COMPOSITE BLADE.
SN 6-227,557 (4,425,553). LOW FREQUENCY PULSE GENERATOR APPARATUS.
SN 6-242,505 (4,434,492). METHOD AND APPARATUS FOR IODINE VAPORIZATION.
SN 6-247,495 (4,425,518). HIGH VOLTAGE FIELD EFFECT TRANSISTOR PULSE APPARTUS.
SN 6-260,879 (4,431,994). COMBINED RADAR/BAROMETRIC ALTIMETER.
SN 6-271,753 (4,426,648). SIMULTANEOUS SIGNAL DETECTION FOR IFM RECEIVERS BY DETECTING INTERMODULATION PRODUCTS.
SN 6-300,766 (4,424,679). CONSTANT THRUST HYBRID ROCKET MOTOR.
SN 6-300,767 (4,426,032). TOOL SEALING ARRANGEMENT AND METHOD.
SN 6-304,122 (4,432,485). CORRUTHERM EXPAN-

SION FIXTURE.
SN 6-308,975 (4,426,705). DOUBLE ELECTRIC DISCHARGE COAXIAL LASER.
SN 6-311,471 (4,431,864). COMMUNICATIONS SYSTEM INPUT-OUTPUT CONVERTER.
SN 6-318,655 (4,430,942). MISSILE/CANISTER LATERAL SUPPPORT PAD FLYOUT CONTROL SYSTEM.
SN 6-322,042 (4,424,585). CHEMICAL LASER NOZZLE BLADE SUPPORT SYSTEM.
SN 6-324,914 (4,433,438). SOBEL EDGE EXTRACTION CIRCUIT FOR IMAGE PROCESSING.
SN 6-326,975 (4,431,996). MISSILE MULTI-FREQUENCY ANTENNA.
SN 6-337,347 (4,432,609). RADIATION PROTECTION LOUVER.
SN 6-337,348 (4,426,663). REAL-TIME OPTICAL FILTERING METHOD WITH IMPROVED FILTERED IMAGE DETECTION AND BANDWIDTH ADJUSTMENT.
SN 6-339,206 (4,426,131). REPLACEABLE DIFFRACTION GRATINGS FOR COOLED LASER OPTICS.
SN 6-342,996 (4,433,045). LASER MIRROR AND METHOD OF FABRICATION.
SN 6-343,059 (4,430,894). ADJUSTABLE FLUID RESISTORS FOR USE IN AN INTEGRATING ACCELEROMETER.
SN 6-347,807 (4,431,149). GEARED TAB.
SN 6-361,643 (4,432,817). PROPELLANT CONTAINING AN AZIDONITROCARBAMATE PLASTICIZER.
SN 6-366,742 (4,433,198). DEVICE TO MEASURE TEMPERATURE OF AN ANNULAR ELASTOMERIC SEAL.
SN 6-370,312 (4,431,946). POSITIVE SPACE-CHARGE CLOSING SWITCH APPARATUS.
SN 6-393,268 (4,427,841). BACK BARRIER HETEROFACE ALGAAS SOLAR CELL.
SN 6-407,220 (4,427,388). YOKE MOVER.
SN 6-418,106 (4,431,555). OXIDATION STABLE POLYFLUOROALKYLETHER GREASE COMPOSITIONS.
SN 6-418,114 (4,431,556). OXIDATION STABLE POLYFLUOROALKYLETHER GREASE COMPOSITIONS.
SN 6-484,328 (4,432,815). AZIDO FLUORODINITRO AMINES.
SN 6-484,735 (4,432,814). AZIDO ESTERS.
SN 6-508,938 (4,424,398). PROCESS FOR PREPARATION OF ENERGETIC PLASTICIZERS.
SN 6-547,611. A METHOD FOR VACUUM BAKING INDIUM IN-SITU.
SN 6-552,554. OPTICALLY PUMPED CW SEMICONDUCTOR RING LASER.
SN 6-552,555. TRANSMISSIVE DEWAR COOLING CHAMBER FOR OPTICALLY PUMPED SEMICONDUCTOR RING LASERS.
SN 6-569,639. THREE DIMENSIONAL OPTICAL RECEIVER HAVING PROGRAMMABLE GAIN SENSOR STAGES.
SN 6-569,640. COAXIAL FEED THRU.
SN 6-569,642. DIPOLE RING ARAY ANTENNA FOR CIRCULARY POLARIZED PATTERN.
SN 6-574,433. METHOD FOR REFINING MICROSTRUCTURES OF CAST TITANIUM ARTICLES.
SN 6-576,081. INTERSTITIALLY PROTECTED OXIDATION RESISTANT CARBON-CARBON COMPOSITE.
SN 6-576,498. RETRO DIRECTIVE RADAR AND TARGET SIMULATOR BEACON APPARATUS AND METHOD.
SN 6-577,391. SMALL CARTRIDGE HEATER.
SN 6-577,392. BI-DIRECTIONAL CURRENT DIFFERENCER FOR COMPLEMENTARY CHARGE COUPLED DEVICE (CCD) OUTPUTS.
SN 6-577,412. ASSYMETRIC THRUST WARNING SYSTEM FOR DUAL ENGINE AIRCRAFT.
SN 6-578,335. CIRCUMFERENTIALLY WRAPPED CARBON-CARBON STRUCTURE.
SN 6-578,397. WIDE BANDWIDTH RADAR HAVING IMPROVED SIGNAL TO CLUTTER REPONSE CHARACTERISTICS.
SN 6-579,625. METHOD FOR PREPARING AN IMPROVED PITCH IMPREGNANT FOR A CARBON-CARBON COMPOSITE.
SN 6-694,261 (4,426,540). SYNTHESIS OF VINYL ETHERS.

DEPARTMENT OF THE ARMY

SN 6-154,661. TOPOGRAPHIC FEATURE EXTRACTION METHOD AND APPARATUS.
SN 6-252,443 (4,426,378). THYROTROPIN RELEASING HORMONE IN THERAPY OF SHOCK AND AS A CENTRAL NERVOUS SYSTEM STIMULANT.
SN 6-315,066. THERMAL CONDUCTIVITY MEASUREMENT METHOD.
SN 6-316,205 (4,375,721). COLLAPSIBLE RESTRAINT FOR MEASURING TAPES.
SN 6-418,318. INCOHERENT OPTICAL HETERODYNE FOURIER TRANSFORMER.
SN 6-435,833. METHOD OF CALIBRATING AN OPTICAL MEASURING SYSTEM.
SN 6-437,659. ELECTRICAL CONDUIT DEFECT LOCATION.
SN 6-440,191. DIFFUSION CURRENT-APPLIED CURRENT PHASE COMPARISON.
SN 6-442,700 (4,426,440). INTEGRATED OPTICAL GRATING DEVICE BY THERMAL SI_2 GROWTH ON SI.
SN 6-446,143. OPTICAL FIRE DETECTION SYSTEM.
SN 6-451,992. ENVIROMENTALLY ADAPTABLE ROOF STRUCTURE.
SN 6-456,159. DIGITAL TECHNIQUE FOR CONSTRUCTING VARIABLE WIDTH LINES.
SN 6-512,794. ICE LIFTER MARINE STRUCTURE.
SN 6-552,883. METHOD AND APPARATUS FOR MEASURING THE HYDRAULIC CONDUCTIVITY OF POROUS MATERIALS.
SN 6-565,788. WIDE FIELD OF VIEW TWO-AXIS LASER LOCATOR.
SN 6-565,807. LASER PHOTOCHEMICAL SYNTHESIS OF BENZENE AND ITS DERIVATIVES.
SN 6-566,017. SINGLE AXIS FOLDING LEVER FIN.
SN 6-573,902. ADJUSTABLE EARCUP RETENTION HARNESS.
SN 6-573,908. NOTCH ANTENNA FOR A RADIO COMMUNICATIONS SYSTEM.
SN 6-576,992. SOLID STATE NUCLEAR RADIATION DETECTOR CIRCUIT WITH CONSTANT SENSITIVITY.
SN 6-577,929. METHOD FOR PRODUCING 3-D PHOTOGRAPHS FROM FIXED POSITION X-RAY SOURCE.
SN 6-581,451. IMPROVED SEALING TUBULATION AND METHOD.
SN 6-581,496. PHASED ARRAY ANTENNAS WITH BINARY PHASE SHIFTERS.
SN 6-581,833. MILLIMETER WAVE SIGNAL LIMITER.
SN 6-582,193. MILLIMETER WAVE IMAGE GUIDE BAND REJECT FILTER.
SN 6-583,920. BROADBAND MULTIPACTOR DEVICE.
SN 6-585,718. MBE GROWTH TECHNIQUE FOR MATCHING SUPERLATTICES GROWN ON GaAs SUBSTRATES.
SN 6-590,614. METHOD OF SYNTHESIZING SM-CO SYSTEM FILMS.

DEPARTMENT OF THE INTERIOR

SN 6-177,976 (4,437,994). EXTRACTION OF METAL IONS FROM AQUEOUS SOLUTION.
SN 6-285,247 (4,438,473). POWER SUPPLY FOR AN

INTRINSICALLY SAFE CIRCUIT.

SN 6-383,060 (4,435,302). CONCENTRATING AND RECLAIMING MAGNETIC FLUIDS.

ENVIRONMENTAL PROTECTION AGENCY

SN 6-149,458 (4,439,136). THERMAL SHOCK RESISTANT SPHERICAL PLATE STRUCTURES.

NATIONAL SECURITY AGENCY

SN 6-251,664 (4,435,783). MAGNETIC BUBBLE LOGIC APPARATUS.

TENNESSEE VALLEY AUTHORITY

SN 6-407,526 (4,427,432). CLARIFICATION OF BLACK AMMONIUM POLYPHOSPHATE LIQUIDS-RECYCLING OF BYPRODUCT "TOPS".

SN 6-414,689 (4,427,433). PRODUCTION OF GRANULAR AMMONIUM-POLYPHOSPHATE WITH AN INLINE REACTOR AND DRUM GRANULATOR.

SN 6-427,723 (4,424,176). PROCESS FOR GRANULATION OF MOLTEN MATERIALS.

SN 6-458,403 (4,435,372). PRODUCTION OF PURIFIED STRONG WET-PROCESS PHOSPHORIC ACID.

Status of PTO Services

The following is an update of the status of PTO services for April 1984:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	26	Problems due to conversion to new computer system.
Trademarks	30	75	
Patent/Trademark Copies:			
Window Coupons	5	96% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		Apr. 6, 1984	
Certified Copies:			
Trademark Registrations	30	13	
Applications-As-Filed	20	99% within 15 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	26	Delay is temporary due to a special work project.
Filing Reg. Certificates	3	8	Delay due to registrations received late.
Assignments:			
Patents	25	18	
Trademarks	25	15	
Avg. Days from Issue Fee Payment to Issue Date	90-100	91	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 1 day late	
Patent Copies Available	Issue Date	Avg. 2 days late	Problems should be resolved by end of May.
Trademark Copies Available	Issue Date	Avg. 4 days late	Due to GPO printing contractor.
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Trademark Regs. Mailed	Issue Date	Avg. 6 days late	Due to GPO printing contractor.

*Figures include mail processing and delivery time.

IMPROVEMENTS TO SERVICES

- *Microfilming of Patented File Histories* —We have awarded a contract for the microfilming of patented file histories. By June, new issues should be available in microfiche format for viewing and copy production on issue day. Specific notice of availability will be placed in the Patent Public Search Room. During the summer, we will begin microfilming the backfile of patented files starting with the most recently issued files. By the end of this calendar year, we plan to have all 1984 issues on microfiche.

This is a major step in improving the file integrity of the individual file wrapper contents, as well as the completeness of the entire collection. Also, orders for files which are on microfiche can be filled more promptly. As we continue to have more files on microfilm, we will have more room for the paper file histories which are now at the Federal Records Center in Suitland, Maryland.

- *Public Newsline* —As an added service to the public, we have place an electronic bulletin board in the Patent Public Search Room. Through the use of video terminals, members of the public can obtain current information under the following headings.

1. Public Information Contacts and Services
2. Locations of Patents by Classification
3. Automated Search Room Tools
4. Status of PTO Services
5. News Items

Additional suggestions of items to be added may be submitted to the manager of the Search Room, Bernard Thomas.

• *Patent and Trademark Copy Sales* —In June, a new service contractor for patent and trademark copy sales will replace the current contractor, MACRO. While we will try to minimize disruptions in services during the transition period, your understanding of temporary disruptions to service would be appreciated.

One of the new services to be provided by the new contractor will be SPECIAL ORDERS that will be filled in 1 day. This special service will cost $2.00 per copy. A specific notice will be published when this service is available.

May 8, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of May 29, 1984

PP. 4,747	4,375,763	4,415,481	4,428,288
Re. 31,311	4,377,348	4,415,756	4,428,517
D. 260,039	4,382,033	4,417,525	4,429,106
D. 267,746	4,383,939	4,418,287	4,429,298
4,221,220	4,390,587	4,419,310	4,429,367
4,231,037	4,391,681	4,419,584	4,430,155
4,239,111	4,392,149	4,419,851	4,430,417
4,242,471	4,394,774	4,420,204	4,430,548
4,248,732	4,395,368	4,420,337	4,430,598
4,251,886	4,395,404	4,420,376	4,430,653
4,271,072	4,396,262	4,420,720	4,430,915
4,280,005	4,396,388	4,420,957	4,431,001
4,285,770	4,397,014	4,422,698	4,431,024
4,293,254	4,400,442	4,422,777	4,432,407
4,313,905	4,402,242	4,423,319	4,433,103
4,323,732	4,402,460	4,423,499	4,433,900
4,327,115	4,402,572	4,423,805	4,434,127
4,329,471	4,404,676	4,424,340	4,434,130
4,337,240	4,404,735	4,424,376	4,434,725
4,339,757	4,405,021	4,425,331	4,435,321
4,341,260	4,407,584	4,425,471	4,435,334
4,349,359	4,409,629	4,425,592	4,435,347
4,353,729	4,409,886	4,426,220	4,435,427
4,355,236	4,410,023	4,426,375	4,435,581
4,356,840	4,410,126	4,426,686	4,435,961
4,361,438	4,411,181	4,426,697	4,436,166
4,361,636	4,411,505	4,427,069	4,436,331
4,370,632	4,412,607	4,427,903	4,436,682
4,372,946	4,413,346	4,428,032	4,436,993
4,373,341	4,413,520	4,428,043	
4,375,481	4,414,319	4,428,048	

Dedications

3,364,790.—*Jean-Jacques Asper* and *Aymar Lefrancois*, Geneva, Switzerland. POWER TRANSMISSION MEANS. Patent dated Jan. 23, 1968. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,705,144.—*Pierre Genequand*, Geneva, Switzerland. VACUUM INTERRUPTER OR SWITCH FOR ELECTRIC POWER NETWORKS. Patent dated Dec. 5, 1972. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,730,771.—*Helmut Tannenberger*, Geneva, and *Jean-Claude Charbonnier*, Chene-Bougeries, Switzerland. ELECTRIC ACCUMULATOR. Patent dated May 1, 1973. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,773,558.—*Jean-Claude Charbonnier*, Saint Germain-en Laye, France and *Helmut Tannenberger*, Geneva, Switzerland. ELECTRIC ACCUMULATOR WITH BETA ALUMINA SEPARATOR AND ELECTROLYTE CONSISTING OF A SALT IN AN ORGANIC SOLVENT. Patent dated Nov. 20, 1973. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,788,232.—*Karl Schneider*, Plan-les-Ouates/Geneve; *Gerard Cuenoud*, Grand-Lancy/Geneve; *Gabriel Bouladon*, Versoix/Geneve and *Paul Zuppiger*, Athenaz/Geneve, Switzerland. TRANSPORT SYSTEM. Patent dated Jan. 29, 1974. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,806,353.—*Paul Heinzer*, Geneva, Switzerland. COPYING PROCESS UTILIZING A RECORDING MATERIAL COMPRISING ELECTRICALLY CONDUCTIVE PARTICLES HOMOGENEOUSLY DISPERSED IN A DEFORMABLE INSULATING POLYMERIC SUBSTANCE. Patent dated Apr. 23, 1974. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,827,961.—*Denis Doniat*, Moillesulaz, *Augusto Porta*, Troinex, Geneva, and *Jacques Mosetti*, Grand-Lancy, Geneva, Switzerland. METHOD FOR PURIFYING IONICALLY CONDUCTING SOLUTIONS. Patent dated Aug. 6, 1974. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,847,265.—*Jacques Ehretsmann*, Conches/Geneve; *Emile Barbey*, Geneve and *Paul Heinzer*, Zurich, Switzerland. INK RIBBON HAVING AN ANISOTROPIC ELECTRIC CONDUCTIVITY. Patent dated Nov. 12, 1974. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,870,561.—*Jean-Claude Charbonnier*, St.-Germain-en-Laye, France and *Helmut Tannenberger*, Geneve, Switzerland. ELECTRIC ACCUMULATOR. Patent dated Mar. 11, 1975. Dedication filed Mar. 26, 1984 by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,090,927.—*Jean-Marie Fresnel*, Haut-Thoiry, France; *Antonin Kulhanek*, Le Lignon and *Augusto Porta*, Geneva, Switzerland. PROCESS FOR ELECTRO-DEPOSITING A METAL ON CONDUCTING GRANULES. Patent dated May 23, 1978. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

4,277,513.—*Willy Rufer*, Onex and *Robert Menzi*, Geneva, Switzerland. PROCESS FOR THE MANUFACTURE OF A FOODSTUFF HAVING A FIBROUS STRUCTURE SIMILAR TO THAT OF MEAT. Patent dated July 7, 1981. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remainig term of said patent.

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 14, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Action New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-08-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-18-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	3-22-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-19-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	1-26-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-07-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-03-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	1-10-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-15-81

Expiration of patents: The patents within the range of numbers indicated below expire during April 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,311,921 to 3,316,555, inclusive

Plant Patents ..... Numbers 2,730 to 2,733 inclusive

REISSUES

MAY 29, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,590
ATOMIZATION IN ELECTROSTATIC COATING

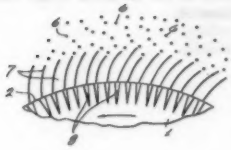
Michio Mitsui, Yokohama, Japan, assignor to Ransburg Japan, Ltd., Tokyo, Japan

Original No. 4,148,932, dated Apr. 10, 1979, Ser. No. 872,066, Jan. 25, 1978. Application for reissue Apr. 1, 1981, Ser. No. 250,095

Claims priority, application Japan, Feb. 7, 1977, 52/12286; May 31, 1977, 52/63872

Int. Cl.³ B05D *1/04*; B05B *5/04*

U.S. Cl. 427—31 **13 Claims**



1. A method of atomizing a liquid paint using a rotating atomizing device and electrostatically coating an article with a smooth homogeneous film of liquid paint, wherein an electrostatic field is established between the peripheral edge of the rotating atomizing device and the article to be coated and the liquid paint flows toward the edge of the atomizing device as a continuous thin film, characterized in substantially reducing the thickness of the paint film as it reaches the peripheral edge by flowing the film over a series of circumferentially spaced recessed grooves which run substantially in the direction of paint flow and terminate at the discharge edge, where said grooves extend into the peripheral edge of the device, and atomizing the liquid paint film as it is projected beyond the peripheral edge.

11. A method of atomizing a liquid and electrostatically spray coating the surface of an article with the atomized liquid comprising:

feeding liquid at a controlled rate from a source to an atomizing means having a surface effective during rotation of said atomizing means for supporting a film of liquid to be atomized, and a circular discharge end adjacent the liquid film support surface having a surface inclined with respect to said liquid film support surface;

rotating said atomizing means such that the liquid fed to said atomizing means is formed into a film of liquid on the liquid film support surface;

flowing the film of liquid through a series of grooves in the liquid film support surface extending into the discharge end surface, such that a series of independent streams of the liquid are formed by said grooves, said streams being spaced along the discharge end surface at positions corresponding to the positions of said grooves and producing a spray of finely divided discrete particles; and

establishing between said discharge end and the article an electric field of sufficient strength to draw the particles away from the atomizing means toward the article.

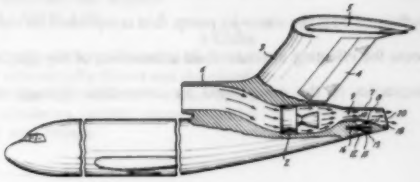
Re. 31,591
FUSELAGE TAIL JET ENGINE THRUST REVERSER AND METHOD

George T. Drakeley, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Original No. 3,997,134, dated Dec. 14, 1976, Ser. No. 562,587, Mar. 27, 1975. Continuation of Ser. No. 133,339, Mar. 24, 1980, abandoned, which is a continuation of Ser. No. 967,212, Dec. 7, 1978, abandoned. Application for reissue Nov. 30, 1981, Ser. No. 325,706

Int. Cl.³ B64D *33/04*

U.S. Cl. 244—110 B **5 Claims**



5. In an airplane designed for conventional landing at substantial forward speed and having a steerable nose wheel and main landing gear located rearward of the nose wheel, a power plant installation comprising a jet engine mounted in thrust relationship to the aft portion of the airplane and having rearward-discharge duct means for normally directing the exhaust of the jet engine rearward, one and only one reverse-thrust duct means constituting the sole reverse-thrust duct means of such jet engine and having an exhaust intake that opens in the rearward-discharge duct means and an exhaust outlet that opens downward at the aft portion of the airplane, said reverse-thrust duct means being directed only forward and downward from said rearward-discharge duct means for discharge of jet exhaust at the aft portion of the airplane, and control door means selectively movable during landing of the airplane from a normal position closing said exhaust intake of said reverse-thrust duct means for discharge of jet exhaust rearward through the rearward-discharge duct means to a reverse-thrust position opening said exhaust intake and obstructing the rearward-discharge duct means for discharge of at least the major portion of the jet exhaust downward and forward through said reverse-thrust duct means to produce thrust on the aft portion of the airplane having a rearward component tending to retard forward movement of the airplane during the landing ground run and an upward component tending to pitch the nose portion of the airplane downward about a fulcrum located in the vicinity of the main landing gear for increasing the pressure of the nose wheel on the ground and consequently increasing the steering effectiveness of the nose wheel during landing.

Re. 31,592
METHOD AND APPARATUS FOR OPERATING A WATER-JET PUMP

Siegfried Heilenz, D-6300 Giessen-Kleinlinden 1, Fed. Rep. of Germany

Original No. 4,310,287, dated Jan. 12, 1982, Ser. No. 95,132, Nov. 16, 1979. Application for reissue Aug. 19, 1982, Ser. No. 409,482

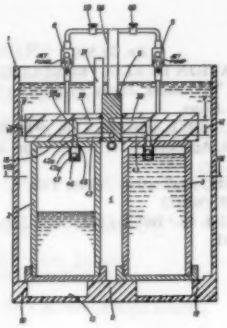
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850142

Int. Cl.³ F04F *5/44*

U.S. Cl. 417—54 **24 Claims**

6. An apparatus for operating a water-jet pump, comprising at least two ejecting receptacles, connection water channels

which connect the ejecting receptacles to the water-jet pump, at least one let-down vessel, first connection air channels which connect the ejecting receptacles to the let-down vessel, a compressed air connection for supplying compressed air, further connection air channels which connect the compressed air connection to the ejecting receptacles, first water valve means for effecting alternate fluid connection of the ejecting receptacles to the water-jet pump through the connection water channels, second water valve means for effecting fluid connection of the ejecting receptacles to the water which is discharged from the water-jet pump, first compressed air valve means for effecting alternate fluid connection of the ejecting receptacles to the compressed air connection through the further connection air channels and second compressed air valve means for effecting alternate fluid connection of the



ejecting receptacles to the let-down vessel through the first connection air channels.

PLANT PATENTS

GRANTED MAY 29, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,237

***PHOTINIA×FRASERI* CV. MONSTOCK**

Gavin Espinosa, Azusa, Calif., assignor to Monrovia Nursery Co., Azusa, Calif.

Filed Jul. 26, 1982, Ser. No. 402,059

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct *Photinia×fraseri* referred to as *Photinia×fraseri* cv. Monstock as substantially shown and described; a superior selection characterized by a densely compact habit; smaller foliage; persistent stipules on current growth; and its distinctive reddish coppery new foliage.

5,238

DISTINCT VARIETY OF STREPTOCARPUS NAMED ORCHIS

Emil Keller, Hedingen, Switzerland, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Dec. 28, 1982, Ser. No. 452,819

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

5,239

DISTINCT VARIETY OF STREPTOCARPUS NAMED KATHI

Emil Keller, Hedingen, Switzerland, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Dec. 28, 1982, Ser. No. 452,859

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

PATENTS

GRANTED MAY 29, 1984

ERRATA

For CLASS	See PATENT NO.
188–067	4,450,605
072–062	4,450,612
070–168	4,450,695
123–458	4,450,783
285–003	4,451,056
308–184	4,451,110
312–221	4,451,111
318–778	4,451,112
354–173	4,451,150
548–461	4,451,402
435–183	4,451,487
420–464	4,451,639
329–145	4,451,792
358–022	4,451,840

PATENTS

GRANTED MAY 26, 1891

INDEX

PATENTS

GRANTED MAY 29, 1984

GENERAL AND MECHANICAL

4,450,591

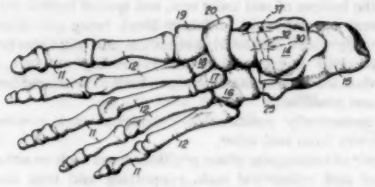
INTERNAL ANTI-PRORATORY PLUG ASSEMBLY AND PROCESS OF INSTALLING THE SAME

Mark J. Rappaport, 555 Wyncourtney Dr., Atlanta, Ga. 30328

Filed Dec. 10, 1981, Ser. No. 329,186

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1.9 **3 Claims**



1. A process of correcting pes plano valgus comprising the steps of preparing a prosthesis by producing a unitary biocompatible plastic plug having a major base, a minor base and a tapered conical sidewall, tapering from said major base to said minor base and securing flexible lines to said plug so that the lines extend from said minor base, exposing the sinus tarsus of a persons's foot, inserting the lines and said plug, minor base first into the subtalar opening between the talus and calcaneous bones of said foot so that said plug is disposed within the sinus tarsus of said foot, continuing the insertion of said lines through said subtalar so that said lines pass above the posterior tendon and thence around opposite portions of the deltoid ligament, adjacent to said sinus tarsus and thereafter tying the end portions of said lines together, sufficiently close to said deltoid ligament that the lines restrain said plug within said sinus tarsus and prevent said plug from being forced outwardly therefrom, said plug being sufficiently large that it does not pass through the sinus tarsus but is wedged therein.

4,450,592

JOINT SOCKET FOR A HIP JOINT PROSTHESIS

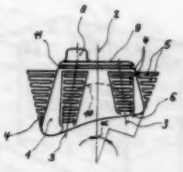
Peter G. Niederer, Zollikofen, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 8, 1982, Ser. No. 338,195

Claims priority, application Switzerland, Feb. 20, 1981, 1133/81

Int. Cl.³ A61F *1/04*

U.S. Cl. 3—1.912 **7 Claims**



1. A joint socket for a hip joint prosthesis comprising

a body having an internal socket disposed about an axis of rotation and an exterior surface tapering inwardly towards one end symmetrically of said axis;

a plurality of anchoring beads projecting from said exterior surface, each bead being of an outwardly increasing width in a direction towards said one end to widen conically relative to said axis of rotation; and

a plurality of ribs in each said bead disposed transversely to said axis, at least some of said ribs being elastic.

4,450,593

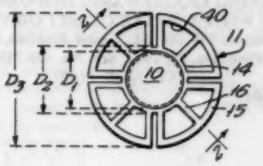
INTRAOCULAR AND CONTACT LENS CONSTRUCTION

Stanley Poler, New York, N.Y., assignor to Lynell Medical Technology Inc., New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,622

Int. Cl.³ A61F *1/16, 1/24*; G02C *7/04*

U.S. Cl. 3—13 **13 Claims**



12. A unitary lens and haptic construction integrally formed from the same single composite continuously laminated sheet of two different uniformly thick ply materials at least one of which materials is transparent and of optical quality and constitutes a relatively thick rigid first ply of said single sheet, the other ply material of said single sheet being relatively thin compared to the thickness of said first ply, said construction comprising a relatively thick rigid central lens component peripherally eroded exclusively from said first ply material to a generally circular periphery of lens-component diameter (D_1), and a relatively thin pliant generally annular and radially outwardly extending haptic component formed exclusively of said other ply material, said haptic component having a central opening concentric with said lens-component and peripherally eroded from said other ply material to a diameter (D_5) which is less than the diameter (D_1) of said lens component, whereby said haptic component is in concentric peripherally continuous retained laminated overlap with one side of the rim region of said lens component.

4,450,594

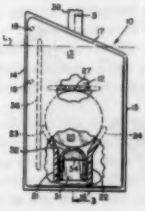
TANK DISPENSER WITH END-OF-LIFE INDICATOR

Peter Hotchkin, Rochester, N.Y., assignor to The R. T. French Co., Rochester, N.Y.

Filed May 2, 1983, Ser. No. 490,777

Int. Cl.³ E03D *9/02*

U.S. Cl. 4—228 **15 Claims**



1. A toilet tank dispenser, comprising

a housing disposed to be suspended in a toilet tank, and having in its wall at least one port for admitting water into the interior of the housing when the toilet tank fills, and for permitting part of the water in the housing to be dis-

charged therefrom each time the associated toilet is flushed,

a generally cup-shaped member in said housing having therein a water soluble dye, and

means in said housing including a water soluble, water-treating tablet releasably holding said member beneath the level of the water in said housing, and in an inverted, inoperative position in which the water in said housing is prevented from coming into contact with said dye,

said tablet being disposed eventually to dissolve away after repeated flushing of the associated toilet thereby to release said member, which then floats to an upright position in said housing to allow water therein to contact said dye.

4,450,595

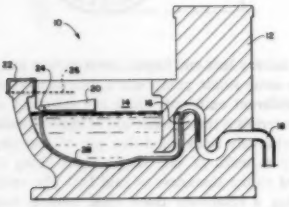
WATER SAVING LIQUID WASTE DISPOSAL SYSTEM FOR USE WITH A WATER CLOSET OR THE LIKE

Geno Saccomanno, 778 26½ Rd., Grand Junction, Colo. 81501

Filed Sep. 29, 1982, Ser. No. 426,718

Int. Cl.³ E03D *13/00*

U.S. Cl. 4—301 **13 Claims**



1. A liquid waste disposal system for use with a water closet communicating with a source of water for flushing the same and communicating through a trap to a sewer line comprising:

a plate positioned within the water closet bowl for receiving and collecting a liquid, said plate being shaped and positioned such that a liquid impinging upon the plate is received and collected by the plate and caused to flow toward a relatively small area of the plate;

means for positioning said liquid receiving and collecting means in the vicinity of the water closet; and

means for transporting liquid received and collected by the plate directly to the sewer line substantially without the liquid contacting water from the water source.

4,450,596

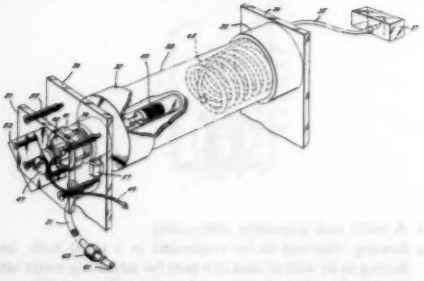
RECTAL HYGIENE SYSTEM

Marvin C. Cohen, 829 Timber La., Dresher, Pa. 19025

Filed Feb. 19, 1982, Ser. No. 350,512

Int. Cl.³ E03D *9/08*

U.S. Cl. 4—447 **4 Claims**



1. A rectal hygiene system suitable for use in connection with a standard type toilet seat of a standard type toilet, the toilet seat having a toilet seat opening and the toilet including a bowl, without change of said toilet seat and toilet position or relation, comprising:

a spraying projector block suitable for providing a fountain of water, said projector block having a first larger size bore thereinto through a first face of said block, and a second smaller bore meeting said first bore and extending through said projector block to a second face thereof, said first and second bores meeting at approximately a 30° angle, said second bore terminating in a water expressing aperture, said projector block suitable for attachment to the bottom of said toilet seat, and spaced behind the toilet seat opening, said projector block being positioned entirely within said bowl space when said toilet seat is down on said bowl, said water expressing aperture being shielded from contamination in both a raised and lowered seat position;

a horizontally positionable cylindrical tank positionable away from said toilet;

a pair of rectangular plates positioned one each on either end of said cylindrical tank, supporting said tank above a surface;

an electrical resistance heater for heating water in said tank extending partially into said tank from a first end thereof, said heater having an electrical insulation tube separating it from said tank interior;

a temperature-evening coiled tube within said tank immersed in said heated water in said tank having a first open coiled tube end for receiving heated water proximate an end of said tank, said coiled tube extending toward an opposite end of said tank partially into the length of said tank and terminating in a second coiled tube end;

a first fitting through said second end of said tank;

a pick off tube connected to said coiled tube at said second end thereof and terminating proximate to said second end of said tank; and

first fluid duct means for connecting said first end of said tank to a household water supply, and second fluid duct means for connecting said fitting to said projector block larger size bore, water in said tank passing through said temperature-evening coil prior to discharge for use through said fitting, having acquired an even, constant desired temperature during passing through said coil.

4,450,597

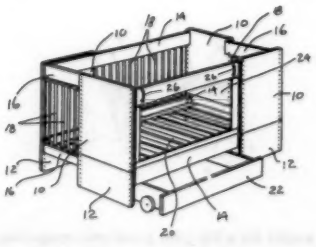
CONVERTIBLE BED

James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049

Filed May 24, 1982, Ser. No. 381,186

Int. Cl.³ A47B *83/00*

U.S. Cl. 5—2 R **6 Claims**



1. A rectangular convertible bed comprising: at least four rigid rectangular panels; a plurality of elongated rectangular side and end rails secured to the panels and extending therebetween to support the panels in an upright position at each corner of the bed, with two of the panels constituting side panels at first and second diagonally opposite corners of the

bed, and with two of the panels constituting end panels for the bed at third and fourth diagonally opposite corners of the bed, said bed having a first configuration in which the side rails extend across the inner faces of the respective side panels to provide a crib of fore-shortened length, and said bed having a second configuration in which the side rails extend only to the inner side edges of the respective side panels, so that the width of the side panels contribute to the length of the bed; and mattress support means supported by said rails adjacent to the lower edges of said panels.

4,450,598

LIP CONSTRUCTION FOR DOCK LEVELLER

Kurt K. Larsen, Pell City, Ala., assignor to Blue Giant Equipment of Canada Ltd., Brampton, Canada

Filed Aug. 30, 1982, Ser. No. 412,503
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.1 **4 Claims**

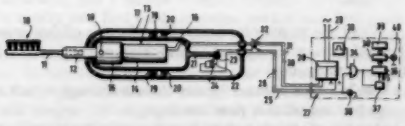
1. A lip for pivotal connection to the ramp of a dock leveller, said lip comprising upper and lower rectangular steel plates secured together and in overlapping relationship along the substantial length thereof to provide front and rear lip edge portion, said plates being separated at the rear lip edge portion by means for pivotally connecting said lip to a dock leveller ramp, said upper plate being slightly bent in the length thereof to define an upper plate first planar portion secured adjacent one end thereof to said connecting means and a second planar portion, said first planar portion and said second planar portion forming a slight angle therebetween on the underside of said upper plate, said lower plate being bent in the length thereof to define a first lower plate portion connected to said connecting means and contacting said upper plate first portion intermediate the length thereof, a second lower plate portion underlying the remaining upper plate first portion and a third portion underlying the upper plate second portion and extending slightly therebeyond adjacent the front lip edge portion, said lower plate second portion and the overlapping upper plate first portion being welded and said upper plate second portion and said lower plate third portion being welded, the welded plates cooperating to place said upper plate in compression and said lower plate in tension when a load is applied to the upper plate of said lip during use.

4,450,599

ELECTRIC TOOTHBRUSH

Hans U. Scheller, and Karl A. Scheller, both of Eislingen, Fed. Rep. of Germany, assignors to Württembergische Parfümerie-Fabrik GmbH, Eislingen, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,194
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117160
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—22 R **12 Claims**



1. An electric toothbrush apparatus comprising:

a toothbrush having a stem and a plurality of bristles at one end of the stem;

oscillator means for imparting an oscillating motion to the toothbrush while the apparatus is operated;

timing means for timing the duration of periods of operation of the apparatus and providing an indication of the total duration of accumulated periods of timed operation;

means responsive to pressure applied to the bristles of the toothbrush, for activating the timing means for the periods of operation in which the pressure applied to the toothbrush stem exceeds a predetermined minimum pressure;

comparator means responsive to the timing means, for comparing the accumulated total duration of timed operating periods with a predetermined minimum period; and

signaling means responsive to the comparator means, for signaling an operator when the accumulated total duration of timed operating periods exceeds the predetermined period;

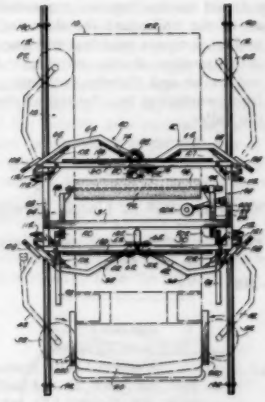
wherein the periods of operation in which the pressure applied to the toothbrush stem exceeds the predetermined minimum pressure may be timed to ensure effective utilization of the apparatus.

4,450,600

GANTRY WASHING DEVICE FOR TRACTOR-TRAILER TRUCKS

Richard J. Shelstad, 933 Heritage Ct., Mequon, Wis. 53092

Filed Jul. 23, 1982, Ser. No. 401,100
Int. Cl.³ B60S *3/06*
U.S. Cl. 15—53 A **12 Claims**



1. A device for washing tractor-trailer truck units including

a pair of laterally-spaced, elongated track means defining a wash bay into which a tractor-trailer unit can be moved;

a gantry adapted to move over the tractor-trailer unit and including laterally-spaced, front and rear upright stanchions supported on wheel means which ride on said track means;

a pair of rotary vertical tractor brushes pivotally mounted on a front portion of said gantry and on the opposite sides of the wash bay for pivotal movement about a generally vertical axis between a neutral position disposed substantially centrally in the wash bay and a retracted position disposed laterally outwardly from the tractor-trailer unit, said tractor brushes being adapted to scrub the front and sides of the tractor below the elevation of side view mirrors;

a pair of rotary vertical trailer brushes mounted on a rear portion of said gantry and on the opposite sides of the wash bay for pivotal movement about a generally vertical axis between said neutral position and said retracted posi-

tion, said trailer brushes being adapted to scrub the entire height of the sides and rear of the trailer;

means for driving said wheel means to move said gantry rearwardly through a wash cycle from a starting position wherein said tractor brushes are located adjacent the front of the tractor and a stopping position wherein said trailer brushes are located adjacent the rear of the trailer and to subsequently move said gantry forwardly through a rinse cycle from the stopping position to the starting position;

biasing means for biasing said tractor and trailer brushes toward the neutral position;

acutation means for selectively pivoting said tractor and trailer brushes to the retracted position;

latch means for releasably latching said tractor and trailer brushes in the retracted position in response to movement of said tractor and trailer brushes to the retracted position;

release means for selectively releasing said latch means to permit said tractor and trailer brushes to return toward the neutral position;

means for operating said release means in response to movement of said gantry past a predetermined location on the tractor-trailer unit; and

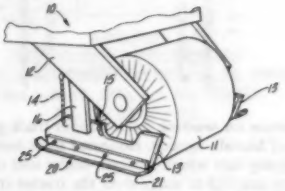
means for counterrotating said tractor brushes and said trailer brushes in one direction during the wash cycle and in the opposite direction during the rinse cycle so that, during rearward movement of said gantry though the wash cycle, said tractor brushes sequentially scrub the front and the sides of the tractor and the lower portion of the trailer and said trailer brushes sequentially scrub the sides and rear of the trailer and so that, during forward movement of the gantry through the rinse cycle, said trailer brushes sequentially scrub the rear and sides of the trailer and said tractor brushes sequentially scrub the lower part of the trailer and the sides and front of the tractor, said latch means retaining said tractor brushes in the retracted position during movement between the tractor and trailer and thereby preventing said tractor brushes from penetrating into the space between the tractor and the trailer.

4,450,601

SWEEPER DRAG SHOE

Warren M. Shwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

Filed Sep. 30, 1982, Ser. No. 430,930
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—246 **7 Claims**



1. In a street sweeper type drag shoe including a horizontally elongated bar having forward and rear ends and a lower, ground engaging face surface and having means for attaching the bar upon a generally vertically arranged plate, the improvement comprising:

said bar having an inverted, channel-like shape with a relatively wide, horizontally elongated, thin channel forming base strip and having channel forming side legs joined with and extending downwardly from elongated edges of the base strip, to thus provide a long, relatively wide but thin channel cavity of substantially uniform depth with said channel cavity having a lower exposed face;

said channel cavity being filled with a matrix formed of relatively small size, hard tungsten carbide particles of irregular shapes and sizes, closely packed together, and with a soft, ductile, somewhat resilient brazing material such as bronze brazing material filling the spaces between and substantially surrounding the carbide particles and brazing the particles together and to the channel base strip and legs;

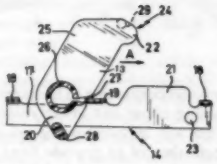
said matrix being resistant to wear caused by abrasion against the ground, and being shock absorbant to resist breakage of the brittle carbide particles and the matrix itself by means of the brazing material yieldably and resiliently absorbing impact forces and permitting limited relative movement of the hard carbide particles under shock loads.

4,450,602

WIPER BRIDGE AND CONNECTOR

Guiseppe A. Maiocco, Rivoli, Italy, assignor to Champion Spark Plug Italiana, S.p.A., Druento, Italy

Filed May 17, 1982, Ser. No. 378,778
Claims priority, application Italy, May 29, 1981, 67726 A/81
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **11 Claims**



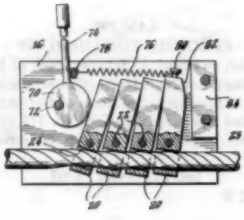
1. A wiper blade bridge (14) having a transverse section substantially the form of an inverted U with a web (18) and spaced side walls (17,21) and a connector (24, 34, 44, 54) for attaching thereto aa wiper arm (1,2), characterized in that the web (18) of the inverted U comprises two openings (15,16) separated by a flat portion (19) of said web (18) which spans the side walls (17,21) and that the connector (24, 34, 44, 54) is rigidly, but releasably mounted on the bridge (14) and on said flat portion (19) of the web (18).

4,450,603

SAIL LINE STOPPER

Jacob Hirsch, Harrison, N.Y., assignor to M. David Hirsch, Harrison, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,499
Int. Cl.³ F16G *11/00*; B65H *17/42*
U.S. Cl. 24—132 R **7 Claims**



1. A sail line stopper for controlling the rate of movement of a line prior to or subsequent to a locking of the line in a fixed position comprising:

a base having a channel formed therein through which a line to be controlled is positioned,

a plurality of closely spaced links mounted for pivotal movement in said base,

an opening for accommodating a line to be controlled in each of said plurality of links forming said channel through said base,

a handle coupled to said links for controlling the pivoting of said links in said base, which control the size of said channel through said base,

said handle in a first position aligning said openings in said links thereby allowing said line to move freely through said channel, said handle in a second position pivoting said links into locking engagement in which said openings are out of alignment thereby restricting the size of the channel through which said line moves to lock said line in said channel, and

intermediate handle positions between first and second positions which control the amount of pivot of said links to control the size of said channel permitting movement of said line through said channel in accordance of the size of said channel.

4,450,604

BUCKLE FOR SEAT BELT

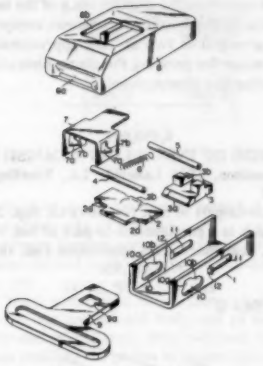
Tetsuya Oowada, Ichikawa, Japan, assignor to Nippon Kinzoku Co., Ltd. and NSK Warner Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,374

Claims priority, application Japan, Nov. 4, 1981, 56-176889

Int. Cl.³ A44B *11/00, 11/08, 11/20*

U.S. Cl. 24—652 **3 Claims**



1. A seat belt buckle, in which a locking member is mounted in a channel-shaped base member and a tongue can be inserted between the base member and locking member and locked in engagement with a tongue engaging surface of the locking member, comprising first symmetrical guide holes each formed in each of opposite side portions of said base member and having a first guide member urging section and a first guide member releasing section; elongated symmetrical second guide holes each also formed in each of said opposite side portions of said base member; a slider movably disposed in the base member and having a tongue urging face; a first guide member penetrating and movable in said first guide holes and urging said locking member when in said first guide member urging sections; a second guide member penetrating said second guide holes and movable together with said slider through said second guide holes from one end to the other thereof and vice versa; a tensile coil spring coupled to said first and second guide members; and a button member having a releasing surface for urging said first guide member toward said first guide member releasing sections; said slider being movable, with the insertion of said tongue between said base member and locking member, to move said first guide member into said first guide member urging sections so as to urge said locking member to bring said tongue into engagement with said tongue engaging surface of said locking member, said first guide member being movable into said first guide member releasing sections, with the depression of said button member, to push said slider in the direction of releasing the engagement between said tongue and tongue engaging surface.

4,450,605

PIPE CLIP

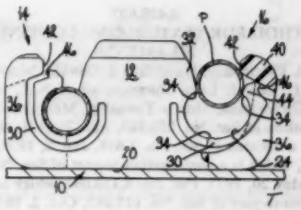
Harald Schäty, Wetzlar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed May 3, 1982, Ser. No. 374,095

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117913

Int. Cl.³ F16L *3/08;* **A44B** *21/00*

U.S. Cl. 24—457 **7 Claims**



1. A plastic pipe clip comprising a body portion having means to enable the clip to be fixed to a support and an arcuate flexible and resilient pipe-receiving arm extending from the body portion and arranged together with the body portion to provide a seat which embraces the pipe round more than 180° of its circumference, there being a gap between the body portion and the free end of the arm through which, upon yielding of the arm, the pipe can be introduced to the seat, and a second more rigid arm projecting from the body portion and round the outside of the flexible arm terminating at an abutment surface disposed thereon close to the free end of the flexible arm, the more rigid arm being so shaped as to allow the flexible arm to open without interference from the more rigid arm when a pipe is pushed into the clip and the flexible arm pressed towards the support, and to prevent opening of the flexibly arm by engagement of a shoulder at the free end of the flexible arm with the abutment surface, when a pipe held by the clip is pulled in a direction away from the support.

4,450,606

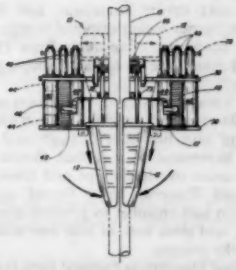
SLIP ELEVATOR

Baron T. Broussard, 1030 Granger St., Jennings, La. 70546

Filed Apr. 15, 1982, Ser. No. 368,757

Int. Cl.³ E44B *21/00;* **E21B** *3/04*

U.S. Cl. 188—67 **9 Claims**



1. A slip elevator apparatus for use on drilling rigs having an

existing rotary table with pin openings, spaced radially from the table control axis, comprising:

a. a frame;

b. anchoring means associated with the frame for removably affixing the frame to a drilling rig rotary table at the rotary table pin openings, while allowing the frame to rotate therewith, the frame occupying during operation a peripheral position on the rotary table, leaving an open center which allows drill pipe to freely penetrate the rotary table center;

c. linkage means forming a connection between the frame and a set of slips to be lifted, the linkage means being movably disposed with respect to the frame between upper and lower position; and

d. biasing means for urging the linkage into the upper position.

4,450,607

METHOD FOR TEXTURIZING CONTINUOUS FILAMENTS

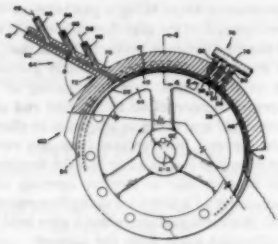
Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Lake Shawnee, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 250,343, Apr. 2, 1981, abandoned, which is a division of Ser. No. 1,618, Jan. 8, 1979, Pat. No. 4,296,535, which is a continuation-in-part of Ser. No. 799,066, May 20, 1977, Pat. No. 4,133,087, which is a continuation-in-part of Ser. No. 619,085, Oct. 2, 1975, Pat. No. 4,024,611. This application Dec. 10, 1982, Ser. No. 448,470

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.³ D02G *1/12, 1/16*

U.S. Cl. 28—257 **9 Claims**



1. A method of crimping continuous filaments, comprising the steps of:

(a) heating said filaments in a heating zone;

(b) feeding said filaments into a heating means having an inlet tube in close communication with a chamber having a stationary cover;

(c) contacting said filaments with at least one stream of heated fluid within said heating means to increase the temperature of the filaments;

(d) directing said stream containing said filaments into contact with barrier means disposed within the chamber, the contact occurring at an angle from 15° to 75° and having sufficient force to initiate crimping of said filaments;

(e) separating a major portion of said stream of heated fluid from said filaments and expelling it from said chamber;

(f) transporting said filaments through said chamber by continuous movement of a surface therein at sufficient velocity to cause overfeeding of said filaments into said chamber, said filaments being forced against a mass thereof within said chamber to produce crimps therein;

(g) contacting said mass with at least one stream of heated fluid to set the crimps;

(h) removing said filaments in crimped form from said chamber; and

(i) preventing broken filaments or plugs thereof from reentering said chamber, after moving to and emerging from the outlet opening thereof, with a rear extension affixed to said cover to the rear of said inlet tube.

4,450,608

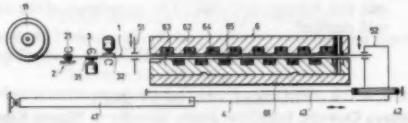
APPARATUS FOR PRODUCING TEMPERED PLATE PARTS

János Balázs; Tibor Báno; Árpád Kollár; Tibor Kovács; Dénes Lengyel, and Ferenc Mózer, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt., Budapest, Hungary

Filed Jun. 18, 1982, Ser. No. 389,539

Int. Cl.³ B23P *13/00*

U.S. Cl. 29—33 R **6 Claims**



1. In an apparatus for producing planar shaped products from band material having at least one unit including a band hobbing and feeding unit, a heating and cooling unit and a cutting mechanism, the improvement comprising a cutting-cooling mechanism arranged on a cross slide and alternately displaceable crosswise to the transfer trace of the band material and wherein the cutting-cooling mechanism comprises pairs of cutting tools arranged in two at least approximately parallel clamp plates, means for pressing the clamp plates together and means for cooling the clamp plates.

4,450,609

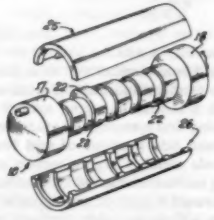
METHOD OF INSTALLING A CAMSHAFT

Steven P. Hamilton, 1506 Lakeside La., Huntington Beach, Calif. 92648

Continuation-in-part of Ser. No. 304,015, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 108,485, Dec. 31, 1979, abandoned. This application Feb. 18, 1983, Ser. No. 467,960

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—156.4 R **3 Claims**



1. A method of inserting a camshaft through a plurality of axially aligned camshaft bearings in an engine;

said method including the steps of:

affixing a removable sleeve over a portion of said camshaft from the side of said camshaft between at least one set of journals on said camshaft, said sleeve having an outer surface which does not extend past an imaginary cylinder formed by joining the outer surfaces of two adjacent journals, said sleeve being supported by said portion of said camshaft between said adjacent journals and having at least a portion of its outer surface lying along the line parallel to the axis of the camshaft position near said imaginary cylinder;

horizontally orienting said camshaft with said sleeve positioned thereon in axial alignment with said plurality of camshaft bearings;

inserting a leading edge of said camshaft with said sleeve thereon through said camshaft bearings

whereby vertical support is provided to said camshaft by using said portion of the outer surface of said sleeve which lies along said parallel line near said imaginary cylinder to support said camshaft as said camshaft is being inserted through said camshaft bearings so that lobes on said camshaft do not impact and damage said camshaft bearings;

laterally removing said sleeve from said camshaft once said camshaft has been inserted into said engine.

4,450,610

METHOD OF MAKING A PISTON

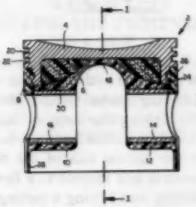
Siefgried Schäper, Wettstetten, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,962

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040125

Int. Cl.³ B23P *15/10*; B29C *27/26*; B29D *3/02*; B65H *81/00*

U.S. Cl. 29—156.5 R **8 Claims**



1. A method of making a piston having a piston bottom forming a working end of a piston;

a piston sleeve formed separately from and form-fittingly connected to said piston bottom and forming a shaft of the piston; and

a piston body within said sleeve connected to said piston bottom at one end of said body and to said sleeve at an opposite end of said body, said body and said sleeve defining eyes enabling the piston to be connected to a member of a piston machine, both said body and said sleeve being composed of fiber-reinforced synthetic resin, said method comprising the steps of:

(a) forming a core having an external configuration corresponding to the internal configuration of said body and traversed by a pin around which said eyes can be formed;

(b) winding said core with a fiber roving impregnated with hardenable synthetic resin to form said body;

(c) applying said bottom to said body;

(d) winding a fiber roving impregnated with synthetic resin onto said bottom and around said body to form said sleeve; and

(e) withdrawing said core from the piston thus formed.

4,450,611

METHOD OF MANUFACTURING A BLADE WHEEL

Hiroshi Ito, Kawagoe; Toshihiko Yoshio, Hidaka, and Masuo Nagashima, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 325,015

Claims priority, application Japan, Aug. 21, 1980, 55-113969

Int. Cl.³ B23P *15/04*; B23K *31/02*

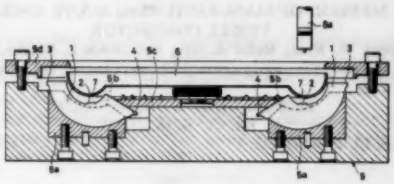
U.S. Cl. 29—156.8 PC **5 Claims**

1. Method of manufacturing a blade wheel comprising the steps of:

placing and holding a plurality of blades in first jig means for holding the blades in predetermined circumferentially spaced apart positions at predetermined angles, each of said blades having a projection on a concave-curved side edge thereof and claw members extending from opposite end portions of a convex-curved side edge thereof, said projections extending upwardly relative to said first jig means;

positioning an annular core member having a convex outer surface matching said concave-curved sides edges of said blades and a plurality of slits corresponding in number and position with said projections onto said blades in said first jig means with said projections engaging said slits;

securing said core member to each of said blades by welding



at each of the positions where said projections extend into said slits, thereby forming a sub-assembly;

placing and holding a shell member in second jig means for holding the shell member in a predetermined position, said shell member having a concave inner surface matching said convex-curved side edges of said blades and a plurality of slots corresponding in number and position with the radially outermost claw members of said blades;

removing said subassembly from said first jig means and positioning said sub-assembly into said shell member in said second jig means with said radially outermost claw members sliding into and resting in said slots;

securing said sub-assembly to said shell member, thereby producing an entire assembly.

4,450,612

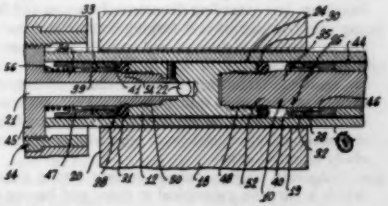
SWAGING APPARATUS FOR RADIALLY EXPANDING TUBES TO FORM JOINTS

John W. Kelly, Burbank, Calif., assignor to Haskel, Inc., Burbank, Calif.

Continuation-in-part of Ser. No. 133,010, Mar. 24, 1980, Pat. No. 4,359,889, and a continuation of Ser. No. 218,431, Dec. 19, 1980. This application Oct. 23, 1981, Ser. No. 314,213

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—62 **32 Claims**



1. A swaging apparatus for expanding a tube radially by the internal hydraulic pressure of a working fluid, said apparatus comprising:

a mandrel to be positioned axially within said tube;

seal means for confining said working fluid between said mandrel and said tube, said seal means including at least one seal member encircling said mandrel to be compressed

axially and expanded radially upon the application of pressure thereto by said working fluid;

a ramp defined by said mandrel and tapered radially inwardly from a large end to a small end, said ramp being positioned so that said seal member can move between an insertion position at said small end of said ramp and a sealing position at said large end of said ramp; and

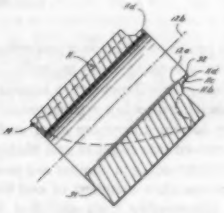
positioning means for preventing angular movement of said seal means relative to the longitudinal axis of said mandrel when said hydraulic pressure is applied and for urging said seal member toward said small end of said ramp when said apparatus is being inserted.

4,450,613

METHOD OF MANUFACTURING ACUTE ANGLED VESSEL CONNECTOR

Bobby W. Ryan; Rufus A. Rye, and James L. Snyder, all of Houston, Tex., assignors to WFI International, Inc., Houston, Tex.

Filed Jan. 21, 1982, Ser. No. 341,554
Int. Cl.³ B21K *21/00*
U.S. Cl. 29—157 T **6 Claims**



1. Method of manufacturing an acute angled vessel connector adapted to be mounted in a vessel or pipeline and to provide an angled connection from such vessel or pipeline to a branch pipe wherein the vessel connector includes a generally cylindrical main body having integrally formed therewith a contoured mounting rim, said main body having a bore therethrough which is directed at a predesignated acute angle with respect to said annular mounting rim, comprising the steps of:

providing an offset forging which is a generally rectangular block having an offset at one end thereof with an approximately diametrical distance from one lower edge at the other end of said forging to an upper edge formed by said offset which is greater than the length of the contoured mounting rim to be machined therein;

machining an interior body bore having a cylindrical inside wall with a central axis in said offset forging generally parallel to the longitudinal axis of the forging and approximately at a predesignated acute angle with respect to an imaginary line extending diametrically across said forging;

facing said one end of said forging so that said one end is precisely perpendicular to said interior body bore;

milling said other end of said forging to provide a curved undersurface which has the same radius of curvature as the vessel or pipeline inside wall in which said contoured mounting rim is to be welded, said curved undersurface intersecting said interior body bore wall in an inner, generally elliptical edge;

machining said forging outside surface into a main body which is partially cylindrical in shape and having certain outside wall portions parallel to said cylindrical inside wall forming said interior body bore and an edge portion of said contoured mounting rim in a generally elliptical shape;

machining said other end of said forging having said curved undersurface into a contoured mounting rim having an exterior ledge portion of gradual curvature, said ledge portion being of sufficient width to allow for x-ray inspection of adjacent weld material, said ledge portion of gradual curvature meeting said outside cylindrical surface of said main body; and

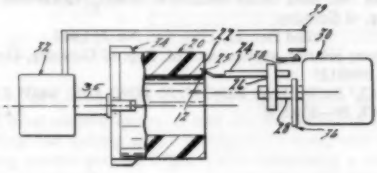
machining said inner edge of said curved undersurface such that said portion of said edge directly receiving fluid flow has a substantially larger radius of curvature than the remainder of said inner edge of said undersurface.

4,450,614

METHOD OF MAKING A POLYTETRAFLUOROETHYLENE HYDRODYNAMIC SEAL

James A. Repella, Southfield, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Feb. 19, 1982, Ser. No. 350,359
Int. Cl.³ B23D *17/00*; B21D *39/00, 53/12*
U.S. Cl. 29—417 **6 Claims**



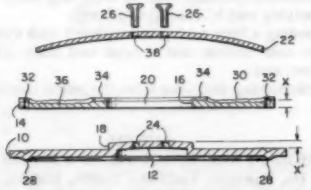
1. A method of making a hydrodynamic seal element from a billet of material having coaxial radially inner and outer cylindrical surfaces comprising the steps of facing off one end of said cylindrical billet to define and end face lying in a plane perpendicular to the central axis of the billet, indexing said billet about the central axis thereof to a first position, advancing a rotatable slitting tool having a cutting edge extending at an angle relative to the central axis of said billet and to the axis of rotation of said tool axially relative to said billet, rotating said slitting tool about an axis spaced from the central axis of said billet to cut a first arcuate slit in the end face thereof, indexing said billet about the central axis thereof to a second position, rotating said cutting tool about the axis of rotation thereof to cut a second arcuate slit in said end face, and advancing a slicing tool radially against said billet to slice off a relatively thin layer thereof.

4,450,615

METHOD OF FABRICATING A HAND CALCULATOR

Anthony G. Pickios, 16 Penn Dr., Dix Hills, N.Y. 11746

Filed Jun. 7, 1982, Ser. No. 385,555
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—437 **4 Claims**



1. A method of fabricating a hand calculator, which comprises the steps of:

(a) punching out on a press die a circular stationary base plate containing a central, circular, raised, portion having both an upper arcuately beveled surface and a stepped circular peripheral bearing edge;

(b) punching out on a press die a circular moveable scale

plate having a thickness within −4.0% tolerance of the height of the central, circular, raised, portion of said circular stationary baseplate and containing a central circular hole permitting its placing on top of said stationary base plate about said bearing edge while affording complete revolving about the same;

(c) punching out on a press die a flat stationary top plate;

(d) forming holes into a central portion of said circular stationary top plate and said circular stationary base plate allowing for proper alignment thereof; and

(e) placing said moveable scale plate on top of said stationary base plate by allowing the raised, portion of said stationary base plate to enter the central circular hole of said moveable scale plate, then placing said flat circular stationary top plate on top of said arcuately beveled surface of said stationary base plate so that formed mating holes align, then conforming said top plate to said arcuately beveled surface of said base plate, and securing the conformed top plate to said arcuately beveled surface of said base plate by means of separate fasteners inserted through said aligned holes in said top plate and said base plate, such that the peripheral edge of said top plate is adjacent to said moveable scale plate while not inhibiting its revolving movement.

4,450,616

METHOD OF ENSURING THE TIGHTNESS OF A BOLT AND A NUT

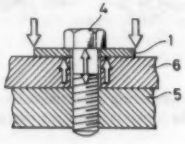
Kiyoshi Morita, Kyoto, Japan, assignor to Yamashina Seiko-Sho, Ltd., Japan

Filed Jun. 29, 1982, Ser. No. 393,336

Claims priority, application Japan, Jul. 3, 1981, 56-104893

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—446 **2 Claims**



1. A method of ensuring the tightness of a fastener comprising:

forming a three-dimensional shape memory annular member in an austenite phase using press means;

cooling the annular member to a temperature lower than the temperature for starting an austenite transformation for easy deformation;

fastening the fastener with the annular member using a lower-than-conventional torque to a degree which flattens the annular member; and

returning the temperature of the annular member to higher than an austenite transformation temperature, so that the recovery power of the annular member for returning the annular member to the three-dimensional shape in the austenite phase generates a fastening force for the fastener.

4,450,617

SYSTEM FOR AND ASSEMBLY OF A PREFABRICATED HOME MODULE

Thomas J. Dillon, Akron, Ohio, assignor to The Dillon Company, Akron, Ohio

Filed May 14, 1981, Ser. No. 263,577

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—430 **5 Claims**

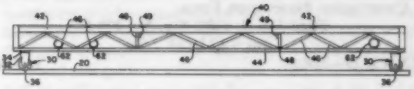
1. A non-installation site in situ process for making a prefabricated building module, comprising the steps of:

(a) providing a plurality of tracks and a support carrier movably mounted upon said tracks;

(b) providing a movably mounted jig extending transversely across and spaced above the tracks and support carrier;

(c) selectively spacing a plurality of trusses from each other with the jig;

(d) providing a plurality of tie beams and connecting said tie beams between the spaced trusses to form a modular base;



(e) placing the modular base on the carrier by lowering the jig;

(f) moving the modular base along the tracks on the support carrier to various construction stations; and

(g) adding additional components to the modular base at the various construction stations along the tracks to form a prefabricated home module.

4,450,618

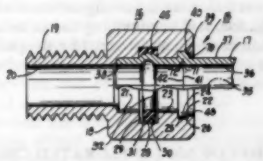
TUBE FITTING ASSEMBLY METHOD WITH DEFORMABLE SEAL

Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903

Division of Ser. No. 916,738, Jun. 19, 1978, Pat. No. 4,330,144, which is a continuation-in-part of Ser. No. 527,683, Nov. 27, 1974, abandoned, which is a division of Ser. No. 425,561, Nov. 17, 1973, abandoned. This application Apr. 26, 1982, Ser. No. 371,545

Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—509 **17 Claims**



1. A method of forming an assembly of a tube and a fitting wherein the tube has inner and outer walls and the fitting has first and second walls defining first and second orifices, respectively, with the second orifice extending along a portion of the first orifice and being of larger cross-sectional area, comprising the steps of:

forming an annular shoulder on the fitting;

holding the fitting;

holding the tube;

inserting an end of the tube substantially only axially into the first orifice of the fitting until it hits a stop which is fixed relative to the fitting;

substantially only axially contracting the length of the tube between the tube end and the tube holder by relative axial movement between the tube holder and the fitting holder;

forming an annular shoulder on the tube at least as early in the process as the axially contracting step;

the axial contraction of the length of the tube establishing a deformed annular first seal between the tube and fitting at said annular shoulders;

continuing the axial contraction of the tube length until two annular parts of the inner tube wall are compressed into mutual engagement to establish a radially expanded bead

on the outer tube wall acting against and being radially restrained by said second wall of said fitting;

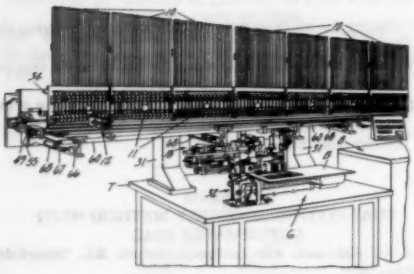
and establishing an annular deformed second seal between an outer surface of said tube and an inner surface of said fitting at said radially expanded bead.

4,450,619

COMPONENT INSERTING MACHINE

Henry L. Wright, Ipswich; Vitaly Bandura, Danvers, and Daniel W. Woodman, Jr., Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 9, 1981, Ser. No. 271,835
Int. Cl.³ B21F *1/02*
U.S. Cl. 29—564.1 **16 Claims**



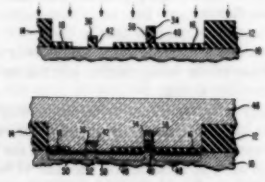
1. In a machine for applying to circuit boards a succession of components selected individually from magazines and having picker means movable in a predetermined sequence between selected magazines and a component conditioning means, the improvement in which each of the magazines is adapted to contain similarly configured components of a center line spacing different from the center line spacing of the components in each of the other magazines and each magazine is provided with control means indicating the configuration of the components in the magazine, said conditioning means being settable to operate on each component delivered by the picker means according to the control means on the magazine from which the component is selected.

4,450,620

FABRICATION OF MOS INTEGRATED CIRCUIT DEVICES

Ellis N. Fuls, Bernardsville; Nadia Lifshitz, New Providence, and Sheila Vaidya, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1983, Ser. No. 468,032
Int. Cl.³ H01L *21/74, 21/265*
U.S. Cl. 29—571 **19 Claims**



12. A method of making an MOS integrated circuit device, comprising the steps of

forming a structure comprising a metallic silicide-on-polysilicon pattern on a silicon body, said pattern comprising polysilicon portions in direct contact with the surface of said body and other polysilicon portions spaced apart from the surface of said body by a relatively thin insulating layer,

implanting a dopant into the silicide portions of said pattern and into selected regions of said body that are uncovered or covered only with said relatively thin insulating layer,

forming a relatively thick insulating layer on the entire top surface of said structure,

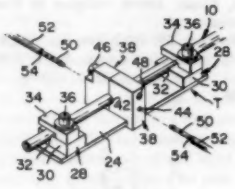
and heating said structure to cause dopants in said silicide portions to diffuse into the polysilicon portions thereunder and into those portions of the body that have polysilicon directly thereover to render those polysilicon portions and body portions conductive and to cause the dopants in the selected regions of said body to diffuse therein to define source, drain and ohmic contact regions, said ohmic contact regions being electrically bridged by said conductive body portions and electrically contacting source or drain regions in said body.

4,450,621

METHOD AND TOOL FOR PREPARING COAXIAL CABLE AND FOR POSITIONING COAXIAL CONNECTOR THEREWITH

Edward A. Bianchi, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 14, 1981, Ser. No. 330,626
Int. Cl.³ H01B *13/20*; B23Q *9/00*
U.S. Cl. 29—828 **9 Claims**



1. A method for preparing a coaxial cable and for positioning and connection of a coaxial connector therewith characterized by the steps of:

clamping the coaxial cable into spaced clamping members of a tool;

securing a drill block member onto said tool between the clamping members, the drill block member having a drill hole therethrough;

drilling a hole into the coaxial cable through the drill hole of the drill block member in alignment with a center conductor thereof;

removing the drill block member from the tool;

positioning a coaxial connector onto the tool between the clamping members so that a center connection member of the coaxial connector is aligned with the drilled hole; and

moving the center connection member into the drilled hole in electrical connection with the center conductor.

6. A tool for preparing a coaxial cable and for positioning and connection of a coaxial connector therewith characterized in that:

a plate includes clamping members at spaced positions thereon in which the coaxial cable is clamped and including locating section means on said plate disposed between the clamping members;

drill block means securable onto said plate at said locating section means and in clamping engagement with the coaxial cable, at least one of said drill block means having a hole in aligment with a center conductor of the coaxial cable to enable a drill to drill at least one hole through the outer jacket and outer conductor and into the dielectric sheathing of the coaxial cable whereafter the drill block means are removed from said plate;

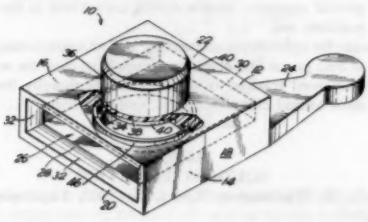
said clamping members serving to position the coaxial connector so that a signal probe thereof is in alignment with the drilled hole and is moved into the drilled hole in electrical connection with the center conductor whereafter said tool is unclamped and removed from the coaxial cable.

4,450,622

MOLDED SHORTING JACK

James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,431
Int. Cl.³ H01R *31/08*
U.S. Cl. 29—842 **12 Claims**



1. A process for forming an electrical connector comprising the steps of:

providing a generally annular electrical contact;

providing an outer shell having opposed upper and lower surfaces and a cavity therebetween, with a hub integrally formed in the upper surface and extending outwardly therefrom and an aperture in the lower surface;

disposing the contact in the cavity of the outer shell;

driving said hub inwardly into said cavity such that said hub shears from said upper surface of said outer shell;

driving said hub further into said cavity such that said contact surrounds said hub; and

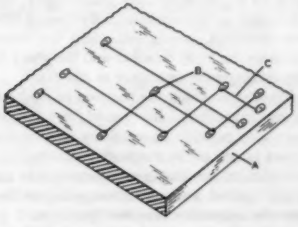
driving a portion of said hub into said aperture in the lower surface of said outer shell, whereby said portion of said hub snugly fits within said aperture.

4,450,623

PROCESS FOR THE MANUFACTURE OF CIRCUIT BOARDS

Robert P. Burr, Matinicus, Me., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Dec. 18, 1981, Ser. No. 332,346
Int. Cl.³ H01K *3/10*
U.S. Cl. 29—850 **17 Claims**



1. A process for extending and fixing continuous conductors between pre-established pairs of contact points on a board base surface along straight paths between selected of said pairs and along inflected paths between selected other of said pairs, the steps comprising:

(a) providing a board base having pads affixed to the board surface at pre-established contact points and points where conductor inflections are to be formed and mounting said board base on a table movable relative to a conductor feed guide, with the surface of said board base having said pads facing said guide;

(b) engaging the end of the conductor to be extended and fixed to said board surface with the pad at the first of a pair of pre-established contact points on said board surface and affixing said end to said first pad;

(c) with said end affixed to said first pad and where said conductor is to be extended and fixed to said board surface between a pair of contact points in a straight path, while feeding said conductor with said guide, moving said board base and said guide in a straight path relative to each other and extending said conductor from said pad at the first of said pair of contact points to the pad at the second of said pair of contact points, severing said conductor and engaging and affixing the severed end of said conductor to said pad at said second contact point;

(d) with said end affixed to said pad at said first of a pair of contact points and where said conductor is to be extended and fixed to said board surface between the pair of contact points in an inflected path, while feeding said conductor with said guide, moving said board base and said guide in a straight path relative to each other in a first direction and extending said conductor from said first of said pair of contact points to the pad at the point in such path where said conductor is to be inflected and affixing said conductor at said inflection point to said pad at said inflection point on said board surface, inflecting said board base and said guide relative to each other and moving said board base and said guide in a straight path relative to each other in a second direction and extending said conductor to the pad at the next following inflection point where there is to be more that one inflection in the path, affixing the conductor at the pad at each such inflection point, inflecting said board base and said guide relative to each other and moving said board base and said guide in a straight path relative to each other in a third direction and extending said conductor through inflection points, as aforesaid, until the pad at the second of said pair of pre-established contact points is reached, severing said conductor at said pad at said second contact point and engaging and affixing the severed end of said conductor to said pad at said second contact point;

(e) each time said conductor is severed and the severed end has been affixed to the pad at the second of the pair of contact points, moving said board and said guide relative to each other to engage the end of said conductor with the pad at the first of the next pair of pre-established contact points and repeating said steps until conductors have been scribed between the pads of all of the pre-established pairs of contact points; and

(f) after all of said conductors have been extended and affixed to said pairs of contact points on said board base to be connected, removing said board base from said table and affixing said conductors along their lengths intermediate said pads to said board base surface.

4,450,624

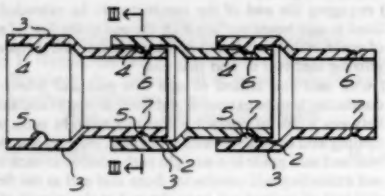
METHOD OF FORMING ELECTRICAL CONNECTORS

John C. Collier, York, Pa., assignor to Burndy Corporation, Norwalk, Conn.

Division of Ser. No. 73,861, Sep. 10, 1979, Pat. No. 4,360,969.
This application Apr. 29, 1982, Ser. No. 373,040
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—881 **7 Claims**

1. A method of fitting an electrical connector housing to an electrical contact comprising forming a chain of connector housings linked end to end, one end of one of each pair of adjacent housings of the chain fitting in and being releasably linked to an end of the other housing of said pair of adjacent housings, feeding said chain in the direction of its length

towards a fitting station and, at said fitting station, effecting relative lengthwise movement between the housing nearest the fitting station and at the leading end of the chain and an electrical contact in such a direction as to cause said leading housing



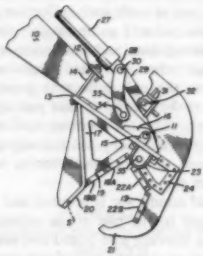
to be fitted onto the contact, and effecting release of said leading housing from said chain by moving said leading housing in the direction of the longitudinal axis of said chain, said chain remaining stationary relative to said leading housing.

4,450,625

MATERIAL HANDLING AND SHEARING ATTACHMENT FOR A BACKHOE

Michael Ramun, and John Ramun, both of Youngstown, Ohio, assignors to Allied Gator, Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 261,679, May 7, 1981, Pat. No. 4,376,340. This application May 12, 1982, Ser. No. 377,390
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.³ E02F *3/28*
U.S. Cl. 30—134 **5 Claims**



1. A cutting and manipulating attachment for a backhoe, the bucket of which has been removed, and having a boom with a controlled piston and cylinder assembly connected thereto, comprising:

a mounting body and means for attaching the same to the boom of the backhoe;

means positioning a fixed cutting blade on said mounting body and means located at a first end of said fixed cutting blade pivotally mounting a movable cutting blade on said mounting body in pivotal relation to said fixed cutting blade from an open position to a closed, workpiece shearing, position;

means for keeping a cutting portion of said movable cutting blade in shearing relation to said fixed cutting blade through the entire extent of the shearing movement of the blades with respect to each other;

said movable blade having an elongated substantially hook-shaped end portion hooked generally toward said fixed blade;

said means for keeping the cutting portion of said movable cutting blade in shearing relation to said fixed cutting blade comprising: a pair of spaced parallel guides located adjacent and fixed to a second end of said fixed cutting blade and extending from said fixed cutting blade second end and defining an elongated guide path, said guide path being positioned and sized to receive said hook-shaped end portion of said movable hook-shaped cutting blade before said cutting portion of said movable blade comes into shearing action with respect to a workpiece disposed between said blades, so that said hook-shaped end portion and said pair of guides hold the workpiece for cutting as said movable cutting blade cutting portion moves in shearing relation with said fixed blade; and said movable cutting blade having a pair of cutting blade portions arranged in a sharp V-shape on a plane offset with respect to said fixed blade, said cutting blade portions positioned so that said blade portions and said fixed blade form a generally V-shape when in said open position, and cage a workpiece therein and urge the workpiece generally toward said pivotal mounting means during movement to the closed position; and

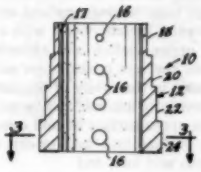
means for operatively connecting said movable cutting blade to said piston and cylinder assembly so that the same can be moved relative to said fixed blade thereby from said open to said closed positions, and vice-versa.

4,450,626

BOLT-CUTTER DEVICE

Charles E. Worthington, R.R. 6, Box 280, Logansport, Ind. 46947

Filed Sep. 24, 1982, Ser. No. 423,429
Int. Cl.³ B26B *13/00*
U.S. Cl. 30—226 **4 Claims**



1. A bolt cutter device, comprising:

a body member and a relatively movable shear body,

the body member being provided with receiver openings adapted to receive the shank of a bolt to be cut,

and retainer means holding the body member and the shear body in a slidable relationship such that movement of the shear body relative to the body member will cause the shear body to operatively engage a bolt whose shank is in one of the receiver openings and thereby shear the bolt;

in a combination in which the body member is provided in the form of a generally cylindrical sleeve, the portions thereof which are circumferentially spaced from the said receiver openings thereof providing the retainer means which retain the body member and the shear body in the slidable arrangement operative as aforesaid;

in a combination in which the portions of the body member which are circumferentially spaced from the said receiver openings also provide an auxiliary support for the bolt positioned in one of the respective receiver openings, by the provision of opening means provided in said circumferentially spaced body member portions diametrically opposite the respective receiver openings;

the said opening means and the said receiver openings providing diametrically-spaced support openings carrying the associated bolt, which is desired to be cut, perpendicularly to the axis of the cylindrical sleeve body member, the bolt-shear operability being accomplished with the bolt thusly held and by the relative sliding of the shear body axially of the cylindrical sleeve body member.

4,450,627

DEVICE FOR DETERMINING A CORRECT SAWING POSITION FOR A PORTABLE ROTARY SAWING MACHINE

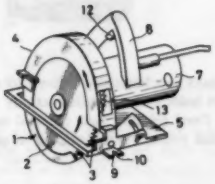
Hiroyuki Morimoto, Hiroshima, Japan, assignor to Shindaiwa Kogyo Co., Ltd., Hiroshima, Japan

Filed Nov. 13, 1981, Ser. No. 321,056

Claims priority, application Japan, Jul. 6, 1981, 56-101111[U]; Jul. 7, 1981, 56-101251[U]; Jul. 22, 1981, 56-109695[U]; Aug. 10, 1981, 56-118942[U]; Aug. 10, 1981, 56-118943[U]

Int. Cl.³ B23D 47/00

U.S. Cl. 30—391 25 Claims



1. A device for determining a correct sawing position for a portable rotary sawing machine of the type having a peripherally curved stationary protective covering over a rotatable saw blade and a base adapted to be slideably placed on a workpiece to be sawn, said device comprising:

an indicator gauge having a V-shaped notch fixedly attached to said base;

window means defining a rectangular opening on the front portion of the periphery of said stationary protective covering in an optimum position to permit an operator to clearly watch said saw blade therethrough;

means associated with said window means defining guide grooves; and

a cover plate removably covering said rectangular opening and including means defining stepped portions at the upper and lower ends thereof and means establishing a finger knob to permit an operator to remove said cover plate from said rectangular opening, said stepped portions being slideably received in said guide grooves to permit sliding removal of said cover plate from said rectangular opening in a lateral direction relative said stationary protective covering; whereby

alignment is ensured for the intended correct sawing operation by simultaneously watching the rotating saw blades, the V-shaped notch of the indicator gauge and the scribing line on the workpiece.

4,450,628

PRINTING PRESS BLANKET GAUGE

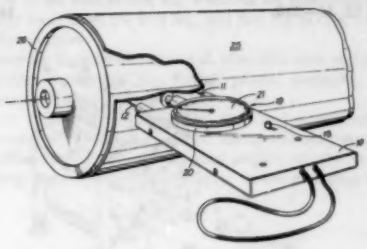
Joseph C. Rocks, 98 Adelaide St., West Ryde, N.S.W., Australia

Filed Jun. 4, 1982, Ser. No. 384,996

Int. Cl.³ G01B 5/06

U.S. Cl. 33—172 E 4 Claims

1. A printing press blanket gauge comprising a casing, a pair of pointed probe members projecting an equal distance from the casing and being shaped to penetrate a printing blanket without damage thereto and make electrical contact with a metal surface underneath the blanket, a probing means projecting from said casing at a position between said pointed probe members and being constructed to bear on the outer surface of said printing blanket without penetration and being movable into and out of the casing, measuring and indicating means within the casing operatively connected to said probing means to be actuated thereby, means to set said measuring and indicating means to zero when the projection from the casing of said probing means is equal to the projection of said pointed probe members, and a source of electricity in said casing operatively connected to said probe members through visible or audible signalling means, the arrangement being such that when both said probing means and pointed probe members are pressed against the surface of a printing blanket said pointed probe members pass through the blanket and are electrically



connected externally of the casing through said metal surface, said probing means is displaced with respect to said casing to actuate said signalling means and said measuring and indicating means gives a direct indication of the thickness of the blanket.

4,450,629

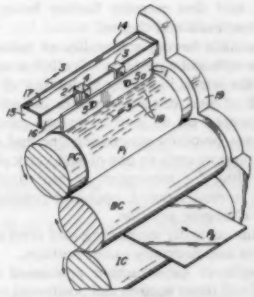
OFFSET PRESS ATTACHMENT

Shirley M. Force, 1801 Yost Rd., Norristown, Pa. 19401

Filed Dec. 6, 1982, Ser. No. 447,285

Int. Cl.³ B41B 1/00

U.S. Cl. 33—184.5 9 Claims



1. A method of accurately, horizontally aligning flexible printing plates on a rotary press having a rotatable cylindrical plate member and a first printing plate or master with images thereon, said printing plate being wrapped around the plate cylinder, the first printing plate or master being correctly, horizontally aligned, which comprises attaching a removable plate guide to means on the press located above the plate cylinder, said plate guide having a movable rectangular prismatic element with its longest dimension running transverse to the plate cylinder and thereabove, adjusting one or more spring tensioned means and thereby allowing the prismatic element to move and twist essentially about its center point until the primary edge formed by the front face and bottom surface of said prismatic element is aligned with a line of images on the plate or master when it is held outwardly, under tension, and at least a portion of said plate or master is flush with the bottom surface of the prismatic element, then replacing the first printing plate or master with a second printing plate or master not in correct horizontal alignment, and then moving the second plate clockwise or counterclockwise on the plate cylinder until a line of images on the second plate or master is even with the primary edge of said prismatic element.

4,450,630

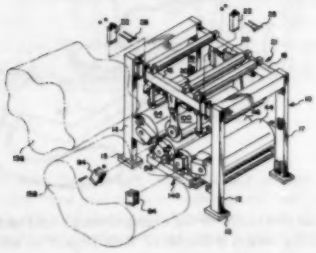
PAPER MACHINE DRYING SECTION

Richard W. Phelps, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Mar. 26, 1982, Ser. No. 362,190

Int. Cl.³ F26B *13/00*

U.S. Cl. 34—116 **14 Claims**



1. A paper machine dryer section for use in combination with a pair of endless wires including an upper wire and a lower wire supporting a paper web therebetween, comprising:

a frame, including substantially vertical frame members spaced laterally to receive the wires and web therebetween, and a pair of substantially parallel, horizontal upper side frame members, each extending longitudinally between the tops of two of said vertical frame members, a first of said upper members having cantilever support means therefor attached to the second of said upper frame members, said first member further having removable portions near each end thereof,

said dryer section having a plurality of heated drums for drying the web and a plurality of rolls for supporting and directing the wires, including a plurality of drum assemblies, each of said drum assemblies including a pair of drums mounted on an arm in spaced relation to each other, means pivotally supporting one end of said drum assembly support arms to one of said vertical frame members providing for movement of said drum assemblies between a normally raised, operative position and a lowered wire changing position,

support means normally supporting said arms and said pairs of drums in said normally raised position,

a lower cantilever sub-structure positioned adjacent the bottom of said dryer section and positioned to engage said drum assemblies when said assemblies are moved to said lowered position,

and removable portions between each of the pairs of drums on said drum assembly arms providing for the threading of the lower said wire therethrough when said drum assemblies are supported on said cantilever sub-structure in said lowered position.

4,450,631

HEATED CAN ROLLS OF HIGH THERMAL EFFICIENCY

James E. Gamble, Newark, Del., assignor to Bunnell Plastics, Inc., Mickelton, N.J.

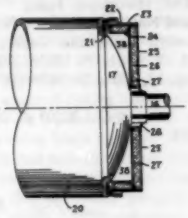
Continuation of Ser. No. 942,942, Sep. 18, 1978, Pat. No. 4,348,819. This application Sep. 14, 1982, Ser. No. 417,842

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—110 **10 Claims**

1. In combination, a cylindrical can roll for drying a continuous fibrous sheet, said can roll being mounted for rotation about its longitudinal axis and having head members attached to the cylindrical body portion thereof by means of a plurality of circumferentially spaced bolts, the heads of which bolts project axially from said head members, thermal insulation means for at least one of said head members, said thermal insulation means comprising a substantially circular panel of thermal insulating material mounted axially of said head member, stud means mechanically affixed to at least some of the heads of said bolts and extending axially of said can roll and engaging in fixed relation said thermal insulating material at circumferential points corresponding to said bolt heads.



4,450,632

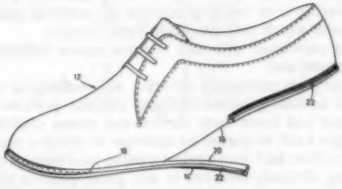
FOOTWEAR

Douglas W. Bensley, 1385 Commissioners Road West, London, Canada

Division of Ser. No. 148,611, May 12, 1980, Pat. No. 4,343,057, which is a continuation-in-part of Ser. No. 100,586, Dec. 5, 1979, Pat. No. 4,326,313. This application May 17, 1982, Ser. No. 379,246

Int. Cl.³ A43B *13/18*; A43D *9/00*

U.S. Cl. 36—17 PW **3 Claims**



1. An article of footwear comprising a preformed forward upper part and a preformed rear part, each upper part having laterally spaced lower edge portions, a first connecting strip attached to the edge portions of the forward and rear upper parts on one side thereof, a second connecting strip attached to the edge portions of the forward and rear upper parts on the opposite side thereof, each connecting strip having a profiled section providing a projecting extension, and a preformed sole unit having a peripheral wall with an internal surface in snapping engagement with the projecting extensions of the first and second connecting strips, the first and second connecting strips being on opposite sides of the sole unit to position the forward and rear upper parts thereon.

4,450,633

CONVERTIBLE SHOE

Kathleen G. Connelly, Santurce, assignor to The Commonwealth of Puerto Rico, San Juan

Filed May 27, 1982, Ser. No. 382,637

Int. Cl.³ A43B *3/24, 11/00*

U.S. Cl. 36—101 **1 Claim**

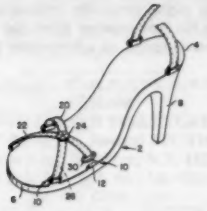
1. A shoe forming assembly comprising:

(a) a sole constructed and adapted to underlie the foot of a wearer,

(b) means for releasably connecting the sole to the foot of the wearer, comprising at least one anchoring means

attached to a side edge of the sole adjacent the toe end and at least one strap having means on its end for releaseable connection to the sole-carried fastening means,

(c) each anchoring means comprising a strip of rigid material which is elongated longitudinally of the sole having a first part connected to the edge wall of the sole, and a second



part extending upwardly from the first part and curved outwardly of the sole from the first part, and

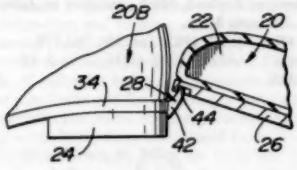
(d) each strap having at its end a ring which is elongated in the direction of the sole and is sufficiently long to pass over the second part of the anchoring means and is formed of material of such diameter that it will be received below the outwardly curved part of the anchoring means.

4,450,634

BOOTS WITH QUICK RELEASE MEANS

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976

Filed Oct. 12, 1982, Ser. No. 433,572
Int. Cl.³ A43B *11/00*
U.S. Cl. 36—138 **15 Claims**



1. In a pair of footwear, wherein each of the footwear of said pair includes an outsole and a heel portion, quick release means which comprises first and second cooperating members, each of said members forming a portion of a respective one of said pair of footwear, said first member comprising a recess in said outsole of one of said pair and said second member comprising a projection from the heel portion of the other of said pair, said recess being configured to receive said projection of the cooperating member, whereupon the wearer of said footwear can position his or her feet so that a portion of the outsole of one of said pair of footwear overlies said projection of the other of said pair, with said recess receiving said projection therein, thus enabling said wearer to readily extract his or her foot from one of said pair of footwear without manual assistance.

4,450,635

LEVEL ADJUSTABLE SKID SHOE FOR PLOW BLADES

Warren M. Shwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

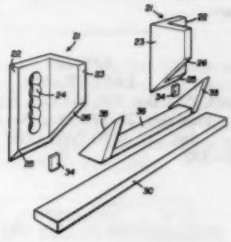
Filed Sep. 24, 1982, Ser. No. 422,800
Int. Cl.³ E01H *5/06*
U.S. Cl. 37—271 **10 Claims**

1. A level adjustable skid shoe initially attached upon a plow moldboard while being capable of adjustment into a working position, and said moldboard having a forward face and a rear face, with an elongated, plate-like blade fastened upon one of said faces and extending beneath the moldboard, and with the blade lower edge forming an elongated, narrow ground engaging bottom surface, said skid shoe comprising:

a bracket having a first leg adapted for fastening upon one face of the moldboard, and a second leg extending angularly away from the first leg, said first leg having a lower edge portion;

a generally horizontally arranged, plate-like wear pad means having a generally flat, lower, ground engaging, wear resistant face;

means for initially holding the wear pad means roughly normal to the first leg and the blade, with said wear pad means having an edge roughly parallel to the first leg lower edge portion, said holding means including bend-



able connector means for fastening one edge of the wear pad means to the lower edge portion of the bracket first leg;

said wear pad means being pivotable into a level working position by bending of said bendable connecting means wherein its face is both longitudinally and transversely substantially parallel with the blade bottom surface, with the connector means holding the pad in such position;

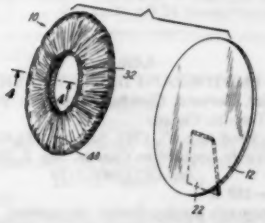
means for maintaining said wear pad means in a level working position, said maintaining means including an arm having a lower end portion fastened to the pad and upper end portion arranged closely adjacent the bracket second leg and being welded thereto after the pad has been arranged in its level working position.

4,450,636

PICTURE FRAME

Mary H. Lasurdo, Huntington Station, N.Y., assignor to Susan Ann Trovato, Valley Stream, N.Y., a part interest

Filed May 3, 1982, Ser. No. 373,836
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152 **6 Claims**



1. Apparatus for displaying a picture, comprising:

a rigid planar backing board;

a flexible annular element having a central through aperture and being of a selected circumferential length for placement around the periphery of said backing board with said

aperture being substantially centrally disposed on said backing board;

wherein said flexible annular element comprises first and second disc-shaped fabric portions, mutually attached substantially completely around the perimeters thereof, said first and second disc-shaped portions having first and second apertures formed therein, respectively, and said first and second apertures forming said central through aperture, and wherein said first disc-shaped fabric portion has a selected color and said second disc-shaped fabric portion has a second selected color, different from said first selected color;

means affixed to said flexible annular element for biasing the edges of said central through aperture radially inwardly, and for retaining said flexible annular element on said backing board, whereby a picture can be placed against said backing board and displayed through said central aperture.

4,450,637

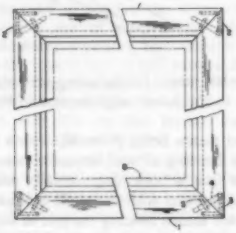
EASY-FRAME

Norman Russ, P.O. Box 508, Norwich, Conn. 06360

Filed Jan. 28, 1983, Ser. No. 437,352

Int. Cl.³ A47G *1/06*; G09F *1/12*

U.S. Cl. 40—152 **1 Claim**



1. A rectangular frame comprising opposed pairs of frame pieces normally arranged in a common plane, said frame pieces having ends adapted to abut one another at the frame corners pivot pins for said frame ends, each pin having an L-shape and each leg of each L-shaped pin being located adjacent to the outer peripheral edge of its associated frame piece and also adjacent to the rear face of its associated frame piece, whereby each frame piece can be pivoted out of said plane to permit placement of flat items in the frame for display, a flat spring extending across the abutting ends of said frame pieces and secured to one of said L-shaped pin legs, said spring having a free end projecting into a cavity defined by that frame piece associated with the other L-shape pin leg, and a staple coupled to the free end of said spring and secured to said other frame piece for achieving movement of one pair of frame pieces in response to movement of the other pair.

4,450,638

PHOTOGRAPH DISPLAY DEVICE

Robert Bader, Toronto, Canada, assignor to Bader Brothers Limited, Toronto, Canada

Filed Aug. 27, 1982, Ser. No. 412,414

Claims priority, application Canada, Sep. 2, 1981, 385055

Int. Cl.³ G09F *1/10*

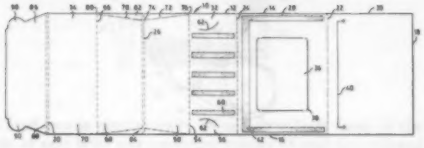
U.S. Cl. 40—158 R **11 Claims**

1. A photograph display device, comprising:

a photograph retaining member of generally flat rectangular shape for displaying a photograph, the photograph retaining member having a front where the photograph is displayed, a back, first pair of oppositely-disposed generally parallel side edges and a second pair of oppositely-disposed generally parallel side edges;

an elongated base member secured to the back of the photograph retaining member, the base member having an elongate side surface and a pair of oppositely-disposed base end portions;

the elongate side surface of the base member being located adjacent to one of the first pair of oppositely-disposed side edges and so contoured that the photograph retaining member is maintained in a first position with the second pair of side edges generally vertically disposed and inclined over the base member when the side surface of the base member is rested on a horizontal surface;



one base end portion being located adjacent to one of the second pair of oppositely-disposed side edges, the one base end portion being so bevelled or formed with lines of weakness to permit the one base end portion to be so bevelled relative to the back of the photograph retaining member, that the photograph retaining member is maintained in a second position in which the first pair of oppositely-disposed side edges are generally vertically disposed and inclined from the vertical towards the base member when the one of the second pair of side edges and the one bevelled base end are located on a horizontal surface.

4,450,639

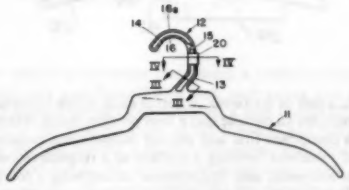
HANGER WITH SIZE INDICATOR PANEL

Everett L. Duester, Zeeland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Apr. 2, 1982, Ser. No. 364,770

Int. Cl.³ A47J *51/098*; G09F *3/10, 3/16*

U.S. Cl. 40—322 **7 Claims**



1. Means for supporting an information bearing tally on a garment hanger, said hanger having a body portion and a supporting hook molded as a single unitary member; said body portion having front and back faces; said hook having a base portion, a convexly curved anchor portion and an intermediate portion, said intermediate portion being straight and substantially vertical and spaced substantially above said body portion by said base portion of said hook and having a panel element integral with the hook and inclined at a minor angle to the lengthwise axis of said body portion, the front face of said panel element being flat for receiving an indicia bearing tally visible from the front and one end of said hanger even when said hanger is supporting a garment.

2. Means for supporting an information bearing tally on a garment hanger, said hanger having a body portion and a supporting hook molded as a single unitary member; said body portion having front and back faces; said hook having a base portion, a convexly curved anchor portion providing a support receiving opening and an intermedi-

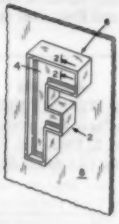
ate portion being straight and substantially vertical and spaced substantially above said body portion by said base portion of said hook and having a panel element integral with the hook, said panel element having generally parallel front and back faces, the front face of said panel element adjacent said opening being flush with the plane of the front face of said body portion and being inclined rearwardly therefrom at an angle of 27° to 30° to the lengthwise axis of said body portion, the front face of said panel element being flat for receiving an indicia bearing tally visible from the front and one end of said hanger even when said hanger is supporting a garment.

4,450,640

SIGN LETTER STRUCTURE

Jay B. Shapiro, 17 South Dr., Roslyn, N.Y. 11576, and William Bank, 3025 Ocean Ave., Brooklyn, N.Y. 11235

Filed Sep. 30, 1982, Ser. No. 430,483
Int. Cl.³ G09F 7/00
U.S. Cl. 40—596 **8 Claims**



1. In an illuminated sign letter structure for use in a sign illuminated from a light source positioned rearward of the letter structure, a generally flat letter-form through which light can pass, a strip material bent to conform to the perimeter of said letter-form and forming a side frame therearound, said strip material comprising inner and outer plies of plastic material extruded about the opposite surfaces of a metal foil, at least the inner of said plies being of a transparent material, and an enlarged side frame end for receiving a letter-form, said metal foil in said enlarged frame end being flat between said plies and forming on the letter-form side of said frame a transparent ply area extending forwardly from the front and around the periphery of said flat letter-form and being illuminated by the illuminating source at the rear of said letter-form, said illuminated transparent ply area around the periphery of said letter-form forming an illuminated edge area in the transparent inner ply around the inner peripheral edge of the letter-form when said letter-form is illuminated from the rear and viewed from the front.

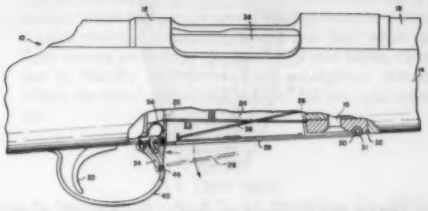
4,450,641

MAGAZINE FLOOR PLATE LATCH FOR BOLT ACTION RIFLES

Douglas E. Bullis, Ilion, N.Y., and Kurt Blumer, Salt Lake City, Utah, assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Nov. 12, 1982, Ser. No. 440,877
Int. Cl.³ F41C 25/00
U.S. Cl. 42—6 **16 Claims**

1. In a firearm having a receiver and a barrel secured to a stock, a cartridge magazine located in the stock below said receiver, and a trigger surrounded by a trigger guard mounted below the stock adjacent to the bottom of the magazine, said cartridge magazine being open at the top to permit cartridge loading through an opening in the receiver and cartridge feeding from the magazine, the bottom of said magazine being normally closed by a removable floor plate adapted to pivot about its forward end, said plate supporting a magazine spring which urges loaded cartridges upward toward the receiver, said firearm further including means for releasing the floor plate to unload the magazine comprising a latch positioned in a central aperture in the front face of said trigger guard, said latch being adapted to pivot about a trigger guard pivot point at a line of contact between the trigger guard and a bottom portion of the latch, and a latch spring bearing upon said latch



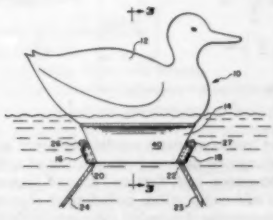
so that the latch normally blocks the floor plate to maintain the plate against the bottom of the magazine, said floor plate being released by application of pressure on the latch against the spring force so that the latch will pivot until it no longer blocks the rear end of the floor plate, thus permitting the plate to swing downward about its forward end.

4,450,642

BUOYANT WATER FOWL DECOY

James A. DeKezel, 2300 79th Ave. West, Lot 97, Rock Island, Ill. 61201, and James R. Lerschen, 218 Elm St., Colona, Ill. 61241

Filed Jul. 12, 1982, Ser. No. 397,551
Int. Cl.³ A01M 31/06
U.S. Cl. 43—3 **8 Claims**



1. A water fowl decoy comprising: a hollow shell body portion which has the shape of a water fowl and which is made of a hard rigid plastic material, a keel shell portion which is made of a hard plastic material, which depends from said shell body portion and which defines with said shell body portion communicating interior chambers, a buoyant foam plastic material within said interior chamber of said shell body portion, and concrete material within said interior chamber of said keel shell portion.

4,450,643

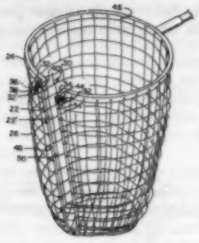
FISHING NET

Theodore W. Cox, 1648 Mussula Rd., Towson, Md. 21204

Filed Dec. 10, 1982, Ser. No. 448,702
Int. Cl.³ A01K 77/00
U.S. Cl. 43—12 **6 Claims**

1. In a system of landing net including a handle supporting a frame which holds an open-top netting and has an opening at the end of the frame away from the handle, and a "U"-shaped member with ends pivotally connected respectively to the frame at respective sides of the opening for supporting the net so that the net has a deployed position with a slot therein communicating with the open top, and has a folded position,

the improvement comprising: means for adapting the system for use in a current in netting a fish head-first, including means



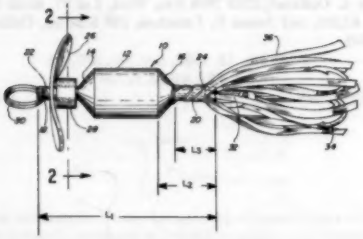
for locking said U-shaped member to said frame in deployed position; and means for unlocking said U-shaped member from said frame for folding and storage.

4,450,644

FISHING LURE

Vitervo Leal, 4744 N. Whipple, Chicago, Ill. 60625

Filed Sep. 28, 1982, Ser. No. 426,150
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.2 9 Claims



1. A fishing lure comprising a solid one-piece body having a continuous elongated central body portion of axially uniform transverse dimension and, first and second opposed end portions, each of said end portions including an elongated rod-like portion of a transverse dimension substantially less than that of said axially uniform transverse dimension and having a free end, and a tapering portion integrally connecting said rod-like portion and said central body portion, means mounted along the rod-like portion of the first of said end portions to freely spin relative thereto in response to travel of said lure through water, a hook, and means for securing said hook near the free end of the rod-like portion of the second of said end portions.

4,450,645

BOTTOM FISHING LURE

Frank A. Ancona, 5424 N. Tracy, Kansas City, Mo. 64118

Filed Apr. 26, 1982, Ser. No. 371,524
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.25 11 Claims

1. A fishing lure comprising:

a. a fishhook having a shank portion with an eye for the attachment of a fishing line at one end thereof, and a rebent bight terminating in a point at its opposite end,

b. a weighted head secured to said hook shank adjacent said eye and rendering said lure positively non-buoyant, to the extent that it will sink to the bottom of a body of water, and remain in engagement with said bottom as the lure is pulled forwardly at normal speeds by said fishing line, and

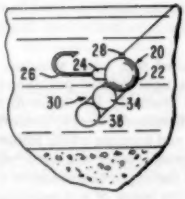
c. a first pair of resilient legs secured in and extending outwardly from said head laterally of said shank, said lure having an upright position resting on the bottom of a body of water, when deposited in water and allowed to sink to said bottom, in which position said hook rests on said bottom and is disposed in a generally vertical plane, with the point thereof uppermost, and with said shank angled upwardly from said bottom to said head, said legs extending transversely in opposite directions from said vertical plane in outwardly and downwardly inclined relation relative to said upright position, whereby to engage said bottom at their outer lower ends to support said head in spaced relation above said bottom, said fishhook being operable to be drawn forwardly, or head end first, over said bottom by tension on said fishing line.

4,450,646

ADJUSTABLE WEIGHT FISHING DEVICE

Peter C. Maltese, 156 Paree Dr., Pittsburgh, Pa. 15239

Filed Apr. 2, 1982, Ser. No. 365,041
Int. Cl.³ A01K *83/00*
U.S. Cl. 43—43.14 10 Claims



1. A fishing device comprising:

a substantially spherical body having a substantially cylindrical neck portion attached thereto;

a hook attached to said neck portion; and

a single tail portion having a plurality of removable members arranged between approximately a 30° to 60° angle with respect to the shank of said hook, with said removable members substantially rigidly connected in series through thin ligaments capable of being selectively and easily removed for decreasing the weight of said fishing device and increasing the buoyancy of said fishing device.

4,450,647

BAIT HOLDER FOR LEECHES

Earl A. Schmidt, 14506 County Rd. 6, Plymouth, Minn. 55441

Filed Jul. 8, 1982, Ser. No. 396,410
Int. Cl.³ A01K *97/04*
U.S. Cl. 43—55 4 Claims

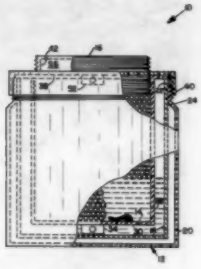
1. In combination, a leech keeper including:

a. a container including an inner wall closed cylinder, an outer wall closed cylinder, the inner wall closed cylinder being of smaller diameter and height than the outer wall closed cylinder, the top of the inner wall closed cylinder and the outer wall closed cylinder secured at a lip slightly above an angulared portion slightly below a top portion of said outer wall closed cylinder, and a plurality of outer threads over an upper distance of said lip common to said top of said inner wall and outer wall of said closed cylinder;

b. a strainer including a round cylindrical member and a

bottom attached thereto, a plurality of holes punched in said cylindrical member and bottom, a string tab secured to an underside of said bottom, a lip secured about a top edge of said cylindrical member, and interior threads adjacent a top edge of said cylindrical member, and;

c. a top including a hollow portion for flotation, a string tab secured to an inner portion of said top, a plurality of inner threads for engaging said outer threads of said container, and a plurality of outer threads for engaging interior



threads of said strainer said top including stepped portions of larger and smaller cylindrical members for supporting said string tab, said inner threads, said outer threads, and said flotation portion respectively whereby said strainer meets between said top and said container providing a watertight closed container for leeches, and whereby said top engages into said strainer and can be secured by said string tabs for floating said leeches in water thereby keeping the leeches alive.

4,450,648

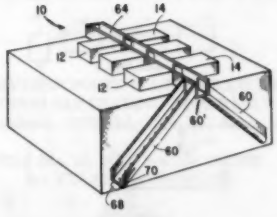
INDUSTRIAL RODENT KILLING DEVICE

Andrew J. Pratscher, 267 Cornell, Calumet City, Ill. 60409

Filed Sep. 29, 1982, Ser. No. 427,718

Int. Cl.³ A01M *23/04*

U.S. Cl. 43—64 **13 Claims**



3. An industrial rodent killing device, comprising:

a feeding chamber having means for entrapping a rodent therein;

a killing chamber, said killing chamber being selectively accessible to said feeding chamber so as to deposit a rodent from said feeding chamber, such that said feeding chamber and said killing chamber are at certain intervals open to each other to form a passageway therebetween for passage of a rodent therethrough;

means for killing a rodent in operational relationship with said killing chamber, whereby a rodent entrapped in said feeding chamber is forced into said killing chamber where it is destroyed;

said killing chamber comprising means for dumping a killed rodent therefrom into a collector adjacent said killing chamber, a side wall having a plurality of passageways through which said means for killing project, and a floor connected to said side wall along an edge surface of each of said side wall and said floor;

means for pivotally mounting said side wall and said floor at the connection of said side wall and said floor so that said side wall and said floor are rotatable together as a unit; and

said means for dumping comprising means for rotating said side wall and said floor such that a portion of said side wall rotates within the interior of said killing chamber to force a killed rodent downwardly toward said floor while said floor rotates away from the interior of said killing chamber to thereby provide an open passageway through which the killed rodent will exit and fall into said collector.

4,450,649

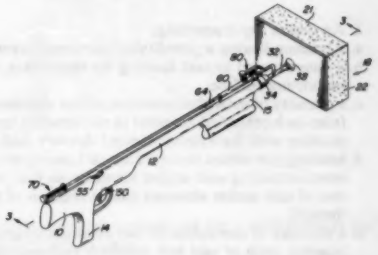
FLY TRAP GUN

John A. Dunwoody, Box 42, R.D. #2, Pennsburg, Pa. 18073

Filed Sep. 24, 1982, Ser. No. 422,686

Int. Cl.³ A01M *3/04*

U.S. Cl. 43—135 **3 Claims**



1. A fly trap gun comprising

an elongated barrel,

a handle projecting from said barrel,

a trigger means mounted adjacent to said handle and movable between a loaded position and a fired position,

a fly trap including base and side wall portions the internal surfaces of which define a trap chamber,

means providing a sticky area throughout a substantial portion of the surface of said trap chamber for catching flying insects trapped in said trap chamber,

a firing rod mounted for longitudinal movement within said barrel and having an extended end located outside of the front end of said barrel,

said firing rod being mounted for movement between a loaded position and a fired position, including means for guiding said firing rod as it moves between said loaded and fired positions inclusive of a guide support and a guide rod mounted for slidable movement in said guide support longitudinally along said gun barrel, said guide rod being secured to said firing rod for conjoint movement therewith, including means for restricting movement of said firing rod and said guide rod in the direction toward the front end of said barrel, said restricting means comprising a ratchet means inclusive of a lever means movable into and out of engagement with notches formed along the length of said guide rod,

actuating means for causing said firing rod to move rapidly from said loaded position to said fired position,

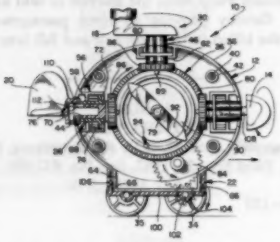
said actuating means being cooperable with said trigger means and responsive to the movement of said trigger means between said loaded and fired positions,

and means for mounting said fly trap on the extended end of said firing rod for movement therewith as said firing rod moves between said loaded and fired positions.

4,450,650
ACTION PLAY TOY

John E. Holden, R.D.#1, Lime Ridge Farm, Mount Joy, Pa. 17552; Fred D. Eddins, P.O. Box 498, Tarklin Rd., Pole 90, Mapleville, R.I. 02839, and Richard W. Kimbrough, 35 Tinker St., Woodstock, N.Y. 12498

Filed Sep. 20, 1982, Ser. No. 420,880
Int. Cl.³ A63H *7/00, 33/00*
U.S. Cl. 46—17 3 Claims



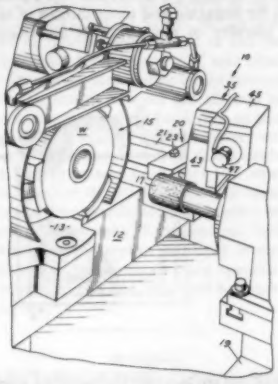
1. An action toy comprising:
a. a housing having a plurality of apertures therein;
b. a base secured to said housing for supporting same on a supporting surface;
c. a plurality of individual rotatable socket elements separate from each other and mounted in said housing and communicating with the exterior thereof through said apertures;
d. housing gear means mounted in said housing mechanically interconnecting said socket elements so that rotation of one of said socket elements causes rotation of the others thereof;
e. a plurality of non-rotatable hub members mounted in said housing, each of said hub members communicating with the exterior of said housing through one of said apertures, one of said socket elements being rotatably received in substantially coaxial relation in each of said hub members;
f. a three-dimensioned element on the exterior of said housing detachably received in engagement on the exterior surface of a hub member in one of said apertures; and
g. a plurality of action elements on the exterior of said housing detachably received in said socket elements for rotation therewith.

4,450,651
STATIONARY GRINDING WHEEL DRESSING UNIT

Kazimierz J. Reda; Victor F. Dzewaltowski; Lawrence I. Millay, and Robert N. Hobbs, all of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 11, 1981, Ser. No. 262,233
Int. Cl.³ B24B *5/00*
U.S. Cl. 51—5 D 4 Claims

1. A grinding machine having a machine bed, a workhead, a longitudinal slide, a cross-slide and a grinding wheel head operatively provided with a grinding wheel for operative engagement with a workpiece carried by said workhead, characterized as further having:
(a) a base extension member mounted on the workhead in cantilever fashion to extend over the machine grinding area and having a first pair of spaced apart undercut slots therein extending in a longitudinal direction relative to the grinding wheel, including means mounting the base extension member in stationary position on the workhead,
(b) a first dressing unit base member positionable longitudinally on the base extension member and having a second pair of spaced apart undercut slots therein extending in a transverse direction toward the grinding wheel, including bolt and nut means in said first pair of slots mounting the first dressing unit base member in an adjusted stationary position on the base extension member,
(c) a second dressing unit base member positionable transversely on the first dressing unit base member including a stiff base portion and interconnected stiff transverse portion and including bolt and nut means in said second pair of slots mounting the base portion in an adjusted stationary position on the first dressing unit base member,

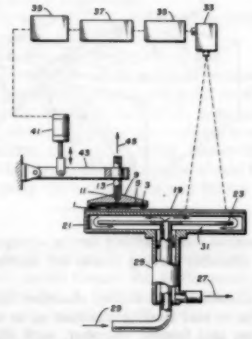


(d) said base extension member, first dressing unit base member and second dressing unit base member providing a stable stationary platform, and
(e) a dressing cutter unit mounted on the second dressing unit base member of the stable stationary platform cantilevered over the machine grinding area and to which the grinding wheel is moved for dressing.

4,450,652
TEMPERATURE CONTROL FOR WAFER POLISHING

Robert J. Walsh, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 4, 1981, Ser. No. 299,378
Int. Cl.³ B24B *7/04*
U.S. Cl. 51—131.4 9 Claims



1. The method of controlling the thermal bow distortion of a hollow internally cooled turntable having a polishing pad mounted on the top surface during polishing of semiconductor wafers held in pressurized rotatable contact with the polishing pad comprising:
circulating a heat transfer fluid through the turntable to maintain the bottom surface of the turntable at a constant temperature, sensing the temperature of said polishing pad, and
regulating the pressure of the wafer against the polishing pad

in response to said sensed temperature to maintain the polishing pad and top surface of the turntable at a constant temperature,

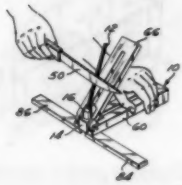
whereby the temperature differential between the top and bottom surfaces of the turntable is maintained constant thereby maintaining the thermal bow distortion of the turntable constant.

4,450,653

KNIFE SHARPENER

J. Lawrence Fletcher, Santa Ana, Calif., assignor to Fletcher Engineering, Inc., Westminster, Calif.

Filed Jul. 21, 1981, Ser. No. 285,491
Int. Cl.[3] B24D *15/08*
U.S. Cl. 51—211 R 27 Claims



1. A knife sharpener, comprising:

a sharpening rod for sharpening the cutting edge of a knife blade;

means for mounting said rod for pivotal movement,

means for limiting said pivotal movement to a selected range of pivotal movement, a different portion of the surface of said rod being in an operable position for use as a knife sharpener at each of the limits of said range of pivotal movement, whereby a user may first sharpen one side of a knife on one portion of the surface of said rod at a first limit of said range and then sharpen the other side of said knife on a different portion of the surface of said rod at a second limit of said range; and

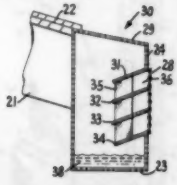
said mounting means including resilient means for urging said rod toward the center of said range of pivotal movement.

4,450,654

PASSIVE DIVERSIONARY FLUID COLLECTING AND DEBRIS SEPARATING APPARATUS

Joseph G. Clendenin, 3475 Ridgeview Dr., Santa Rosa, Calif. 95404

Filed Jan. 18, 1982, Ser. No. 340,475
Int. Cl.[2] E04D *13/06, 13/08*
U.S. Cl. 52—12 6 Claims



1. A passive diversionary fluid and debris separating apparatus for a roof system comprising:

a first planar member extending substantially vertically downward with respect to the roof system, said planar member having inner and outer surfaces, with the outer surface defining the initial downward path of travel of fluid and debris from said roof system along said planar member, said planar member including at least one opening formed therein;

a fluid permeable planar membrane, said membrane being vertically disposed and covering said opening in said planar member;

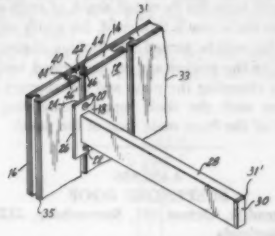
at least one fin extending inwardly and downwardly from said permeable member, such that a portion of the fluid travelling down said membrane is drawn off by said fin, thereby diverting fluids from the outer surface of said member to the inner surface thereof for collection.

4,450,655

VERTICALLY SLOTTED PANEL

Michael R. Rosenthal, 6001 SW. 118 St., Miami, Fla. 33156, and Ivan Parron, 8013 W. 15th Ave., Hialeah, Fla. 33014

Filed Aug. 25, 1982, Ser. No. 411,439
Int. Cl.[3] A47B *5/00*
U.S. Cl. 52—36 7 Claims



1. In combination, (a) a panel and (b) a shelf support and clamp assembly, comprising:

a panel having a top, bottom and side surfaces and a front main face and a rear main face, anc comprising,

an outer front skin,

a first sheet of plywood adhered to the front skin, and

a core of particle board adhered to the first sheet of plywood, and

a second rear sheet of plywood adhered to the particle board, and said particle board being sandwiched between the plywood sheets,

a plurality of spaced vertical slits of common size opening in the front face and extending from the top surface to the bottom surface,

each of said slits defining a throat extending perpendicularly from the front face into the particle board and through the outer front skin and first sheet of plywood, said throat being of predetermined lateral dimension,

said slit defining an enlarged pocket within the particle board extending laterally, perpendicularly to the throat and said pocket being bounded by a rear wall, side walls in opposing relation and a pair of coplanar front wall sections, each section extending from the throat and defining a lip on opposite sides of the throat, each lip being composed of a portion of the particle board, an outer plywood sheet and the outer skin, and

said walls being parallel to one another,

said side walls being spaced from one another a first predetermined distance and said front wall sections and rear walls being spaced from one another a second predetermined distance,

a shelf support and clamp assembly,

said clamp assembly including,

an arm having an inner end and an outer end, said arm being of a predetermined length and height,

said inner end being enlarged and defining a force distributing plate of predetermined height, width and thickness,

said plate width being greater than the lateral dimension

of said throat and overlaying the skin on said lips, and said plate being of a height greater than the height of the arm and said plate defining a zone above and below the arm overlaying the throat and lips,

a countersunk hole in each plate zone, and

a pair of screws, each comprising a threaded shank and head, each of said heads being tapered conically toward the shank and each head being sized to nest in one of said holes in nested relation, with the shank of each screw extending through one of the holes and through the throat and into the pocket when the head of each screw is in the countersunk hole,

a pair of keeper bars in the pocket, each of said keeper bars being of a predetermined width less than the second predetermined distance between said rear wall and front wall sections and of a length greater than the distance between the side walls, and each of said keeper bars having a central internally threaded hole sized for and in threaded engagement with the threaded shank of each screw,

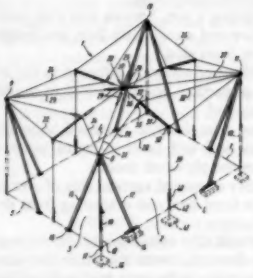
whereby, when the screw is tightened, the width and thickness of the keeper bar will be turned into locking engagement with the side walls of the pocket and be captivated within the enlarged portion clamping the plate and self support in a preselected position with the shelf support extending generally perpendicular of the front main face of the panel.

4,450,656

SUSPENDED ROOF

Johannes Lagendijk, Octant 197, Sterrenburg, 3328 SL Dordrecht, Netherlands

Filed Dec. 14, 1981, Ser. No. 330,515
Int. Cl.³ E04B *1/12*
U.S. Cl. 52—63 **10 Claims**



1. Suspended roof, supported by at least three fixed mountings, of which the supporting roof structure mainly consists of a cable rope construction to which a weather-proof roof covering is applicable, adapted for rainwater drainage to the sides, with diagonal main tension cables led from the fixed mountings which meet in the centre of the roof and which form the roof ridges, and with side top cables,

the roof valleys running into the side top cables between each pair of fixed mountings, characterized in that each side top cable (**20, 22, 24, 26**) has been fixed with its one end to one of the fixed mountings (**11, 8, 9, 10**) and after having been led round the adjacent fixed mounting (**8, 9, 10, 11**), continues as a diagonal main tension cable (**21, 23, 25, 27**) to the centre (**28**) of the roof,

in that the other end of this cable has been connected in the centre (**28**) to the ends of the other diagonal main tension cables and in that each side top cable is mainly tensioned vertically downwards between each pair of fixed mountings by means of a post-tensioning cable,

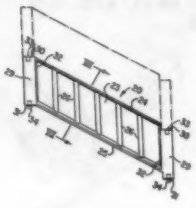
all this in such a way that the centre of the roof is lifted to form the roof apex (**28**), this apex being raised to a higher level than the side top cables on the point where they meet the roof valleys (**38**).

4,450,657

PRE-FABRICATED GRAIN ELEVATOR

Klaus U. Driedger, Edmonton, Canada, assignor to ABL Engineering Ltd., Calgary, Canada

Division of Ser. No. 109,503, Jan. 4, 1980, Pat. No. 4,362,453.
This application Aug. 25, 1982, Ser. No. 411,569
Claims priority, application Canada, Sep. 26, 1979, 336363
Int. Cl.³ E04H *7/00*
U.S. Cl. 52—79.9 **3 Claims**



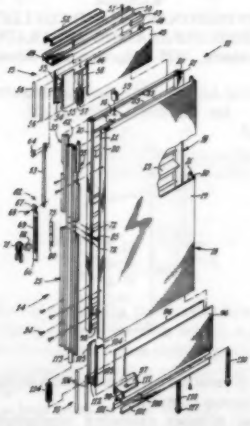
1. A module for constructing an inclined bin comprising a rectangular body constructed as a parallelogram devoid of right angel corners, said body being defined by a bottom wall and side walls integral with said bottom wall; a bearing block at each end of and integral with each side wall; each bearing block having sides parallel to the ends of the rectangular parallelogram body, and top and bottom ends inclined with respect to said bottom of said body and perpendicular to ends of said side walls of the body, whereby, when like modules are stacked vertically the bearing blocks are vertically oriented and the bins defined thereby are inclined.

4,450,658

UNITIZED PARTITION WALL SYSTEM

Gilbert E. Legeai, Strasbourg, France, assignor to Hauserman, Inc., Cleveland, Ohio

Filed Jan. 11, 1982, Ser. No. 337,711
Int. Cl.³ E04D *15/00*
U.S. Cl. 52—126.3 **62 Claims**



1. In a partition system, a panel, a vertical on each end of said panel, each vertical including an outwardly directed relatively shallow channel, a strut positioned in each said channel and

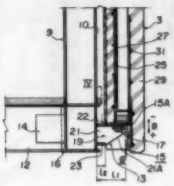
supporting a corresponding end of an adjustable panel head, and drive means in each said channel operative vertically to move the corresponding strut and thus said head.

4,450,659

HORIZONTAL FORCE RESISTING BUILDING STRUCTURE AND ATTACHMENT FOR ATTACHING WALLS TO SAME

Tadashi Hanaoka, Kawasaki; Hiroaki Umezu, Tokyo, and Ginichi Shigaraki, Fujisawa, all of Japan, assignors to Misawa Homes K.K., Japan

Filed Jun. 19, 1981, Ser. No. 275,158
Int. Cl.³ E04B *1/98*; E04H *9/02*
U.S. Cl. 52—167 **7 Claims**



1. In a horizontal force resisting building structure wherein a bearing wall member having a structural core embedded therein is attached through attachments to a steel building framework so as to face a structure plane of the framework, the improvement wherein the attachments comprise:

(a) fastening means;

(b) a pair of upper plate brackets each firmly attached at its proximal end to the framework at a position such that distal ends of the upper plate brackets are fastened through the fastening means to the upper ends of the core; and

(c) a pair of lower brackets each having a horizontal member, and a pair of vertical side plate members for supporting at their upper edges the lower face of the horizontal member, the side plate members each being firmly attached in a parallel manner at its proximal end to the framework at a position such that the horizontal member is fastened through the fastening means to the lower ends of the core;

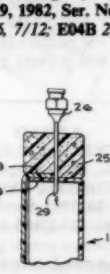
the upper and lower brackets having less resistance to plastic deformation than the core; whereby the wall member is attached through only the four upper and lower brackets to the building framework.

4,450,660

THERMAL BARRIER

E. Keith Dean, 1510 Washington Blvd., and Phillips C. Emmons, 1314-12th St., both of Huntington, W. Va. 25701

Filed Sep. 29, 1982, Ser. No. 426,937
Int. Cl.³ E06B *3/26, 7/12*; E04B *2/00*; B21D *39/00*
U.S. Cl. 52—202 **10 Claims**



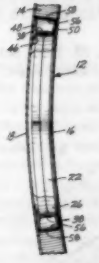
1. A thermal barrier comprising a dual plastic pane sealed air unit which does not require a separate frame, said barrier adapted to be installed on the inside of an existing window opening and mounting within the existing jamb, head, and sill on the inside of the existing window which remains in place, said barrier comprising a pair of rectangular sheets each having cut away corners, edge portions of said sheets being folded at 90 degrees relative to the main portion of the sheets to provide a pair of pan like members, said pan like members being interfitted together to form a hollow box-like member, foam pieces mounted around the periphery of the box-like member, means for withdrawing ambient air from the interior of the box-like member, and means for introducing dry air, inert gas, and the like into the interior of the member, retaining means mounted adjacent to said thermal barrier.

4,450,661

COMPOSITE STRUCTURES WINDOW BELT AND METHOD OF MAKING

Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US81/01321, 371 Date Sep. 30, 1981, 102(e) Date Sep. 30, 1981, PCT Pub. No. WO83/01237, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 30, 1981, Ser. No. 318,642
Int. Cl.³ B64C *1/14*; E06B *3/20, 3/26*; B31D *3/02*
U.S. Cl. 52—206 **7 Claims**



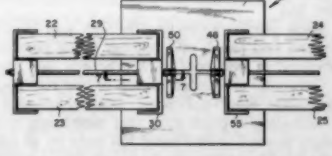
1. A window containing section of a composite structure for fuselage comprising: a row of spaced-apart reinforced plastic window frames, means on the window frames for securing windows within the frames, a layer of reinforcing filaments coated with a resin wound around a periphery of each window frame, a core of honeycomb extending between window frames, a reinforcing filament wound resin impregnated inner shell, and a reinforcing filament wound resin impregnated outer shell to make up a shaped composite structural section.

4,450,662

TENSIONED STRUCTURE WITH ADJUSTABLY MOVABLE COLUMNS AND BEAMS

Remo Melchiori, Jr., 2350 S. 875 East, Zionsville, Ind. 46077

Filed Jun. 1, 1982, Ser. No. 383,521
Int. Cl.³ F04C *3/10, 3/26*
U.S. Cl. 52—223 R **5 Claims**



1. A construction assembly comprising:

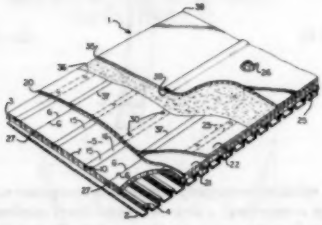
a base plate having brackets;
a first pair of parallel horizontal wood beams mounted to said base plate;
a second pair of parallel horizontal wood beams mounted to said base plate;
a first pair of boots mounted to opposite ends of said first pair of beams;
a first member having opposite ends mounted to said boots placing said member in tension and said first pair of beams in compression;
a second pair of boots mounted to opposite ends of said second pair of beams;
a second member having opposite ends mounted to said second pair of boots placing said second member in tension and said second pair of beams in compression;
first adjustment means connecting one of said first pair of boots with one of said brackets and being operable to horizontally position said first pair of beams relative to said base plate; and,
second adjustment means connecting one of said second pair of boots with another of said brackets and being operable to horizontally position said second pair of beams relative to said base plate.

4,450,663

INSULATIVE ROOF STRUCTURE

Norman C. Watkins, P.O. Box 474, State Rte. EE, Camdenton, Mo. 65020

Filed Jun. 15, 1981, Ser. No. 273,666
Int. Cl.³ E04C *1/24*; E04D *1/08*
U.S. Cl. 52—309.4 **10 Claims**



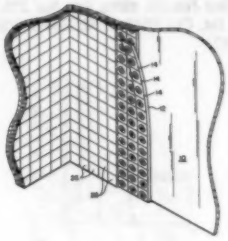
1. An insulative roof structure for application to a roof deck comprising:
(a) a single-layer synthetic organic polymer closed cell foam panel including an upper surface, a pair of opposite edges and a longitudinal groove opening onto said panel upper surface; said groove extending generally parallel to and in spaced relation from said edges;
(b) an elongated strip of rigid reinforcing material positioned in said groove and having a strip upper surface generally flush with said panel upper surface;
(c) a lamina comprising a lower layer of kraft board and an upper layer of metal foil bonded directly to said kraft board, said kraft board layer being bonded to said panel upper surface;
(d) a plurality of mechanical fasteners for retaining said panel against a roof deck, each of said fasteners including:
(1) a head portion engaging said lamina metal foil upper layer; and
(2) a shank portion extending through said lamina, said strip and said panel; said fastener shank portion being embedded in said roof deck whereby said insulative roof structure is retained on top of said roof deck; and
(e) a single-ply elasto-polymeric weather-resistant membrane including a plasticizer, said membrane overlying and being bonded to said metal foil layer by an adhesive; said metal foil layer providing a barrier between said foam panel and said plasticizer in said membrane and said metal foil layer providing a base for said adhesive whereby said membrane is bonded to said lamina; said membrane being exposed and substantially uncovered.

4,450,664

TILE MOUNTING PROCESS AND PRODUCT

Patrick M. McNamee, 330 Guernsey Ave., Columbus, Ohio 43204

Filed Jul. 2, 1982, Ser. No. 394,522
Int. Cl.³ E04F *13/18*
U.S. Cl. 52—385 **4 Claims**



1. In the combination of a tile and a backing member for mounting the tile on a substrate,
the backing member including a front side and a planar back side, means for attaching the backing member to a substrate,
means for forming an opening through the backing member,
the means forming the opening being of thin resilient plastic having slits extending outwardly from said opening to thereby form not less than three flaps around said opening, said flaps being attached to said backing member and projecting therefrom to form said opening at a location spaced from said planar back side toward said front side,
a single prong projecting along a straight line from the back face of the tile and having an enlarged portion which projects laterally from said line to form an outline measured perpendicular to said line which is larger in size than the opening in said backing member and said enlarged portion is of a thickness measured along said line which is less than the thickness between the flaps and the back side of the backing member,
the prong being of a length and the enlarged portion being located thereon such that the enlarged portion will pass through said opening and the flaps will spring into place behind the enlarged position as the back face of the tile engages the front face of the backing member to releasably lock the tile and backing member together, and
means forming a pattern of relief on the front side of the backing member,
the back face of the tile member being configured to nest with the pattern in relief on the front side of the backing member whereby the patterns in relief will nest together when in register and prevent relative rotational movement.

4,450,665

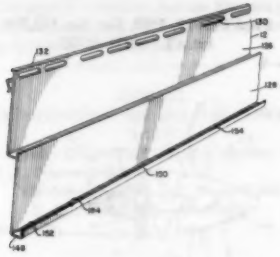
INTERLOCKING BUILDING SIDING

Harry Katz, Westerville, Ohio, assignor to Vinyl Improvement Products Company, Columbus, Ohio

Filed Jul. 10, 1981, Ser. No. 282,140
Int. Cl.³ E04D *1/00*
U.S. Cl. 52—522 **3 Claims**

1. In a building siding panel extruded from a synthetic resin material and being adapted for mounting in generally horizontal overlaping relation with similar panels on a building wall to simulate weatherboard siding, the siding panel including a nailing strip having a plurality of elongated slot-like openings extending along its edge, a locking flange integrally formed on

and projecting outwardly from and downwardly along the outer surface of the panel adjacent the nailing strip and an upwardly directing locking lip integrally formed on and extending along its bottom edge, the locking flange cooperating with the outer surface of the panel to define a downwardly open locking channel having a relatively narrow opening adjacent its open bottom and being substantially wider adjacent its upper portion, and the upwardly directed locking strip being dimensioned to fit within the narrow open bottom of the locking channel, the improvement comprising,



an elongated bead integrally formed on and extending longitudinally of said upwardly directed locking lip adjacent its uppermost edge, and

a plurality of dimples formed in said bead at spaced intervals along its length, said dimples having a dimension measured in a direction generally perpendicular to the plane of the lip which is substantially greater than the width of the narrow opening of said locking channel but less than the corresponding dimension of the locking channel adjacent its upper end.

4,450,666

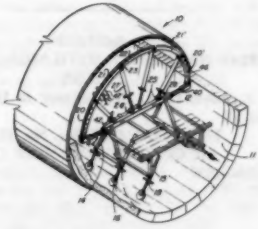
ECONO BRICKING RING

James L. Trumbull, Seattle, and William A. Gillam, Alderwood Manor, both of Wash., assignors to Clayburn Refractories, Inc., Abbotsford, Canada

Filed Aug. 26, 1982, Ser. No. 411,782

Int. Cl.³ E04G *11/20*

U.S. Cl. 52—749 **17 Claims**



1. A bricking ring for use in positioning bricks in an overhead arcuate configuration, comprising:

a rigid, laterally disposed, adjustable support member;

vertically adjustable leg means secured to said support member for positioning said support member;

a plurality of rigid arcuate rail segments pivotally interconnected end-to-end to form a generally semicircular configuration;

a plurality of segment adjustment arms, each arm extending between and connected at its opposite ends to said support member and to a corresponding pivotal interconnection between adjacent rail segments, one adjustment arm being connected to each said interconnection; and

adjustment means for selectively lengthening or shortening each of said adjustment arms.

4,450,667

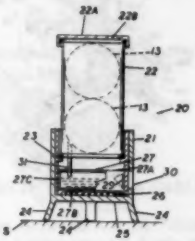
METHOD AND APPARATUS FOR REJUVENATING RUBBER BALLS AND THE LIKE

John Fitzpatrick, 689 Fairchild Ave., Trumbull, Conn.

Filed Aug. 27, 1981, Ser. No. 296,991

Int. Cl.³ B65B *63/08*; A63B *47/00*; H05B *3/06*

U.S. Cl. 53—127 **1 Claim**



1. An apparatus for rejuvenating balls of the type used in the sport of racket ball or the like comprising a stand, having extending tubular wall portions, said stand having a full open top, leg means for supporting said stand in spaced relationship to a supporting surface, a heating means in the form of an electric resistance coil disposed adjacent the bottom of said stand, said stand having an opening formed in a wall portion thereof adjacent the bottom thereof, an inturned annular support disposed intermediate the height of said stand, a reservior container sized to be received in said stand, said reservoir container having an access opening disposed opposite to said stand opening, a spout hingedly connected to said reservoir opening to pivot between a close and open position relative to said access opening, whereby in the open position said spout extends beyond the opening in said stand, a steam conduit extending upwardly from said reservoir container and means defining a ball container for housing the balls to be rejuvenated, said ball container being sized to be received in said stand annular support above said reservoir container, said ball container having a bottom wall formed with a hole therein, said steam conduit extending into said hole formed in the bottom of said ball container, a cover for sealing the upper end of said ball container, and a vent means formed in said cover.

4,450,668

AUTOMATIC PACKAGING MACHINE

Renzo Grossi, Milan, Italy, assignor to Dario Manuli S.p.A., S. Pietro Mosezzo and F.I.S., s.r.l. Macchinari Per Imballaggi, Milan, both of, Italy, a part interest

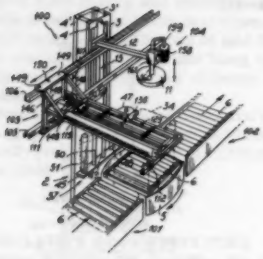
Filed Jun. 4, 1981, Ser. No. 270,691

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—176 **9 Claims**

1. An automatic packaging machine including a first packaging mechanism for helically wrapping the upright sides of the objects to be packaged by means of at least a first sheet and a second packaging mechanism for the installation of at least one separate overcapping sheet on a least one top or bottom end of the object to be packaged, said first packaging mechanism comprising a vertically movable frame, supply means for said first sheet mounted on said frame, means for vertically moving said frame, a power driven turntable for receiving the object to be packaged, a vertically movable lid member for pressing said object to be packaged on the turntable, a load-bearing columnar frame and a slide vertically sliding along the columnar frame, means for vertically moving said slide wherein said lid

member is supported on said slide and intermediate power driven supporting means are provided between said slide and said lid member for controlled lowering and raising of said lid member independently from the lowering and raising of said slide, said second packaging mechanism comprising a carriage movable along rails horizontally positioned on said slide and extending parallel to said turntable, means for horizontally driving said carriage, a cantilevered frame carried on said carriage, at least a bobbin of packaging sheet for said overcapping sheet installation which is supported by said cantilevered frame and movable by said driven carriage together with said



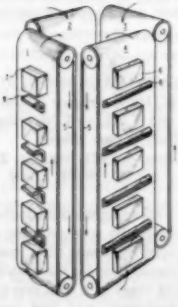
cantilevered frame from a first end position offset from said lid member to a second end position oppositely offset from said lid member, and means for feeding said overcapping sheet onto the top of the object to be packaged so that overlapping edges of said sheet are formed extending over the upright sides of the object thereby allowing said lid member to be lowered onto the top of the object wrapped in a first lateral wrapping and the top of the overcapping sheet so that the overlapping edges of said overcapping sheet may be sandwiched between said first and a subsequent second lateral wrapping by said first packaging mechanism.

4,450,669

LINE OF CONTINUOUS WORKING PACKAGING MACHINES FOR RECTANGULAR PRISMATIC PACKAGES

Gino Rapparini, Viale Roma 17, Bologna, Italy

Filed Jun. 1, 1981, Ser. No. 268,958
Claims priority, application Italy, Jun. 11, 1980, 3445 A/80
Int. Cl.³ B65B *9/12, 51/30*
U.S. Cl. 53—551 **2 Claims**



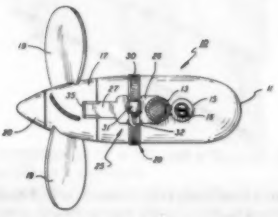
1. A continuous packaging machine comprising four endless conveyor means moveable in synchronization in the same direction with each having a straight run portion, said conveyor means being disposed in a rectilinear configuration with said straight run portions of said conveyor means extending parallel to each other to define an elongated passage having a rectangular cross section for the passage of an elongated hollow tube, complementary package forming means secured to opposing pairs of conveyor means to provide support for the side of said tube during the introduction of a filling into said tube and complementary sealing and crimping means secured to two opposing conveyor means on opposite sides of said forming means in the direction of movement of said conveyor means for closing the tube to define a closed package.

4,450,670

WEED CUTTER FOR BOAT MOTOR

Richard L. Robinson, 8198 Speach Dr., Baldwinsville, N.Y. 13027

Filed Feb. 15, 1980, Ser. No. 121,706
Int. Cl.³ A01D *44/00*
U.S. Cl. 56—8 **4 Claims**



1. In a boat motor having a housing and a propeller that includes a hub rotatably mounted in the housing and a plurality of propeller wings radially extending from the hub, apparatus for slicing through underwater foliage as it approaches the propeller wing. that includes

an elongated cutting tool having a shank and a dependent cutting blade axially aligned along the length of the tool, said blade being a flat, thin element having at least a pair of cutting surfaces formed along the opposed side edges thereof, and

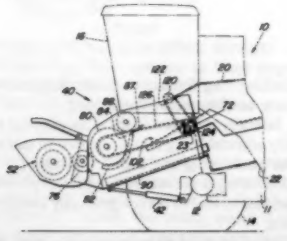
mounting means affixed to the shank of the tool for attaching the tool to the motor housing adjacent to the propeller assembly to position the blade over the propeller hub in close proximity therewith with the axis of the blade lying in the same plane as the rotational axis of the propeller and the plane of the flat, thin blade being substantially tangent to the direction of rotation of said propeller.

4,450,671

COMBINE HARVESTER WITH MODIFIED FEEDER HOUSE

Mahlon L. Love, Osco, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jun. 1, 1982, Ser. No. 383,851
Int. Cl.³ A01D *41/02*; A01F *12/30*
U.S. Cl. 56—14.6 **5 Claims**



4. A combine harvester having a separator housing including

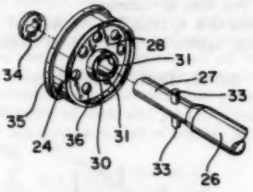
means for processing crop material delivered to the housing and forward means for gathering crop material from a field and delivering it to the housing and including a mobile frame supported above the ground by at least one pair of transversely spaced wheels characterized in that the separator housing includes a body portion rigidly connected to the mobile frame and a forward extension portion pivotally supported by the body portion for pivoting movement about a transverse axis and in that the means for processing crop material includes at least one elongated unitary separating member extending fore-and-aft and spanning at least a portion of both portions of the separator housing upstream and downstream of the transverse axis, the separator housing body portion including support means for the separator element and the forward portion of the separator element extending cantilever fashion into the separator housing forward extension portion.

4,450,672

PULLEY MOUNTING MEANS FOR POWER LAWN RAKE

Ernest R. Dynie, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 9, 1982, Ser. No. 416,148
Int. Cl.³ A01D *7/00, 69/00*
U.S. Cl. 56—16.7 **9 Claims**



1. In a power lawn rake having a housing provided with a motor-driven shaft journaled therein, a driving pulley on the shaft, a rotor having a rotor shaft journaled in the housing, a driven pulley on the rotor shaft and having inner and outer faces, and a belt connecting the driving and driven pulleys, the improvement in means for mounting the driven pulley on the rotor shaft, which comprises: the driven pulley having a through axial bore formed therein, the rotor shaft being received in the bore and having a portion extending therethrough, keying means between the rotor shaft and the inner face of the driven pulley, and a self-locking retaining ring carried by the extending portion of the rotor shaft and bearing against the outer face of the driven pulley for exerting a resilient bias thereagainst to cooperate with said keying means in retaining said driven pulley on said rotor shaft.

4,450,673

MULCHING MOWER

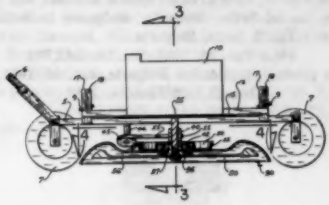
Marion E. Hutchison, 2148 Touchae St., Waterloo, Iowa 50703

Continuation of Ser. No. 177,276, Aug. 11, 1980, abandoned.
This application Oct. 13, 1981, Ser. No. 310,702
Int. Cl.³ A01D *35/00, 53/08*
U.S. Cl. 56—17.5 **21 Claims**

1. In a rotary mower having an engine and a cutting blade for cutting blades of grass, said engine having an output drive shaft and said blade being rigidly secured to said output shaft so that said blade rotates with said drive shaft in a first direction, the improvement comprising:

a housing rotationally secured coaxially on said output drive shaft above said cutting blade, said housing having a central portion, and a continuous peripheral edge disposed downwardly to a point lower than said cutting blade; and

a means for rotating said housing relative to said output drive shaft so as to impart sufficient centrifugal force to the cut blades of grass to impel the blades of grass outwardly and downwardly with respect to said housing; wherein said means for rotating said housing comprises



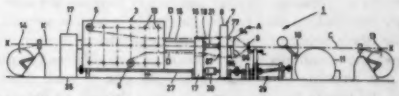
means for transmitting rotational motion from said output drive shaft to said housing.

4,450,674

BACK ROTATION DEVICE FOR A CABLE STRANDING MACHINE

Johannes G. G. Bos; Hendricus J. P. M. Pollaert, and Johannes L. H. Sijben, all of Edisonstraat 9, Venlo, Netherlands

Filed Dec. 14, 1979, Ser. No. 103,670
Claims priority, application Netherlands, Dec. 28, 1978, 7812593
Int. Cl.³ H01B *13/04;* D07B *3/00*
U.S. Cl. 57—6 **6 Claims**



1. A stranding machine for manufacturing cables, particularly communication cables, comprising a feed cage having feed reels, a stranding device, a take-up reel, a back-rotation device, a central shaft, and means for rotating the feed cage and the stranding device with respect to each other about the central shaft axis, characterized in that the back-rotation device comprises a guide ring rotatable about said central shaft axis, having first and second annular guide paths which are eccentric with respect to each other with a given eccentricity,

first and second discs rotatably journalled in said first and second guide paths respectively, said discs having a plurality of respectively corresponding bores arranged in identical patterns about the center lines of the respective discs,

a plurality of eccentric shafts, each shaft having a journal part journalled in a bore of said first disc and an eccentric part journalled in the corresponding bore of the second disc, said journal part and eccentric part having a relative eccentricity equal to said given eccentricity whereby said discs are restrained from rotation relative to each other and upon relative eccentric motion of said disc said eccentric shafts are rotated, each eccentric shaft having a bore for passing a wire strand there through,

a respective plurality of clamping members each associated with and connected to a respective eccentric shaft for rotation with said respective shaft, said clamping members being arranged to impart a torque to a wire strand passing through the respective eccentric shaft bore responsive to rotation of the eccentric shaft, said torque being applied about the longitudinal axis of the wire strand, and

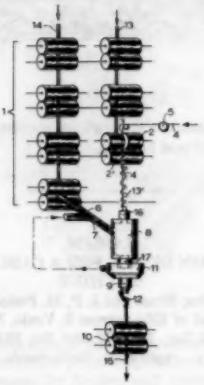
means for rotating said guide ring.

4,450,675

METHOD OF AND APPARATUS FOR THE PRODUCTION OF FANCY YARNS

Georgi M. Petrov; Kiril K. Boev; Igor A. Fidelski, and Yordan T. Pirgov, all of Sofia, Bulgaria, assignors to Institute PO Oblekio I Textil, Sofia, Bulgaria

Filed Jan. 26, 1982, Ser. No. 342,771
Claims priority, application Bulgaria, Jan. 26, 1981, 50541
Int. Cl.³ D02G 3/34, 3/38
U.S. Cl. 57—6 6 Claims



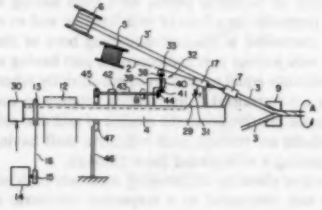
1. Method for the production of fancy yarns from falsely twisted core and fancy threads, comprising drafting staple fibers by a cylindrical drafter and falsely twisting the core and fancy threads by a false twister carried by a hollow spindle, the staple fibers being produced from a cylindrical drafter which allows the simultaneous production of two different draftings for one working unit, feeding at least one of such draftings upon the falsely twisted core and fancy threads by means of a pneumatic transporting channel, the speed of the fibers constituting the fancy threads being greater than the peripheral speed of the rollers delivering the core thread.

4,450,676

APPARATUS FOR STRANDING OPTICAL FIBER CORES WHILE SLACKENING THEM

Katsuji Sakamoto, and Yasunori Saito, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 3, 1982, Ser. No. 404,742
Claims priority, application Japan, Aug. 3, 1981, 56-121698
Int. Cl.³ D02G 3/44; D01H 13/04
U.S. Cl. 57—6 12 Claims



1. An apparatus for stranding optical fiber cores in a slackened state into a core storage tube, comprising:

means to form a tube;

core delivering means having a passage for passing an optical fiber core therethrough, a source of gas and flow passages for directing said gas through said passage in a direction of movement of said core, said gas urging said core through said delivery means under a constant force into said core storage tube; and

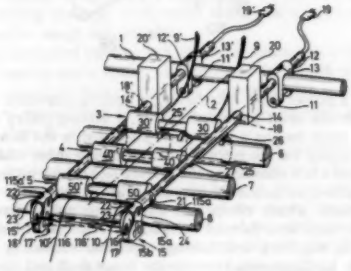
means for reducing the tensile force on said optical fiber core at the inlet side of said core delivering means.

4,450,677

THREAD MONITOR AND A SLUBBING CLAMPING DEVICE FOR DRAW FRAMES OF SPINNING MACHINES EQUIPPED WITH DOUBLE UPPER ROLLERS

Michael von Ronai-Horvath, Ludwigsburg; Bernhard Schoenung, Filderstadt, and Kurt Seebo, Esslingen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 6, 1982, Ser. No. 433,107
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139667
Int. Cl.³ D01H 13/16, 13/18
U.S. Cl. 57—81 7 Claims



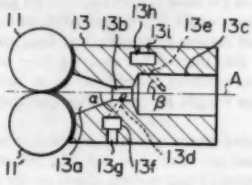
1. In a thread or yarn spinning machine having a drawing frame having at least a set of inlet rollers for receiving material from a source, and a set of exit rollers spaced from the inlet rollers and between which said material is drawn and from which said drawn material is fed to a spindle or the like, each of said inlet and exit roller sets comprising a lower driven roller and a pair of axial spaced upper rollers permitting the drawing of two materials side by side, said upper rollers being journalled in ranked pairs on a common supporting arm extending in the direction of drawing, apparatus for sensing the continuity of the exiting thread and controlling the supply of material to the frame comprising a bearing rail extending along each side of the frame and spaced laterally from the outer edge of the respective double rollers, each rail having in opposition to each other, at its end adjacent the area where the thread leaves the exit rollers, a light source and a light receiving cell, the respective light sources being arranged in association with the opposite receiving cells so that the shadow of the thread remote from the light source and adjacent the associated receiving cell is cast on said associated receiving cell, means for selectively arresting the delivery of said material to each of said inlet roller sets and means responsive to the sensing of the breakage of the thread by said receiving cell for actuating said means for arresting said slubbing.

4,450,678

AIR NOZZLE UTILIZED FOR FASCIATED YARN SPINNING

Susumu Kawabata, Aichi; Hiroshi Niimi, Nagoya; Meiji Anahara, Kariya; Yoshihisa Suzuki, Chiryu, and Hiroshi Omori, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Dec. 21, 1982, Ser. No. 451,754
Claims priority, application Japan, Dec. 29, 1981, 56-211388
Int. Cl.³ D02G 1/16
U.S. Cl. 57—333 7 Claims



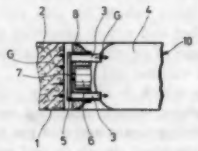
1. An air nozzle utilized for fasciated yarn spinning comprising a narrow passage and a wide passage for a fiber bundle arranged in series along a traveling direction of said fiber bundle, characterized in that each of said two passages is provided with at least a jet for ejecting an air flow toward the traveling direction of said fiber bundle and in that said each jet inclines to intersect an axis of each said passage at an acute angle, the direction of each said jet being tangential to said each passage but reverse to that of another jet about said axis of said passage.

4,450,679

RAM JET ENGINES AND ROTARY GAS FLOW VALVE THEREFOR

Thomas Hähnel, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm G.m.b.H., Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,608
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005864
Int. Cl.³ F02K 7/10
U.S. Cl. 60—251 3 Claims



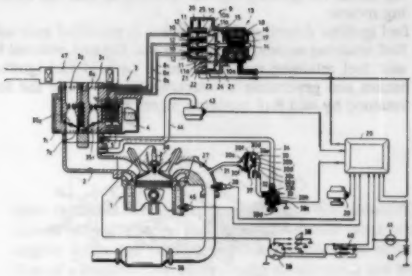
1. A ram jet engine comprising a housing having a precombustion chamber for the burning of solid fuel to generate fuel-rich gases, an after combustion chamber in said housing, a plurality of gas flow conduits connecting said precombustion chamber with said after combustion chamber and a polygonal rotary valve rotatably mounted in said housing adjacent said passage and having corner portions which move through paths which cyclically cover an open said passages, drive means connected to said rotary valve to rotate said valve, and a heat insulation body in said housing between said precombustion chamber and said after combustion chamber, said drive means comprising a drive motor having a rotatable shaft connected to said rotary valve and being mounted in said heat insulation body.

4,450,680

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING SECONDARY AIR SUPPLY CONTROL

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Hasegawa Shumpei, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,800
Claims priority, application Japan, Aug. 12, 1980, 55-111478
Int. Cl.³ F02B 75/10; F01N 3/22
U.S. Cl. 60—274 8 Claims



1. In an air/fuel ratio control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an intake system and an exhaust system, which includes a three-way catalyst provided in said exhaust system of said engine, an O_2 sensor arranged in said exhaust system at a location upstream of said three-way catalyst for detecting the concentration of oxygen in exhaust gases emitted from said engine, and an electrical circuit operatively connecting said O_2 sensor in a manner effecting feedback control operation to control the air/fuel ratio in response to said O_2 sensor, the combination comprising: means for supplying atmospheric air as secondary air into said exhaust system at a zone between said engine and said O_2 sensor; an engine speed sensor for detecting the rotational speed of said engine; a pressure sensor for detecting absolute pressure in said intake system; means for determining activation of said O_2 sensor; electrical means connected to said engine speed sensor, said pressure sensor and said O_2 sensor activation determining means for producing a feedback control interrupting signal when there occurs at least one of the conditions of engine idle, engine deceleration and deactivation of said O_2 sensor, and electrical means responsive to said feedback control interrupting signal to actuate, after the generation of said interrupting signal, said secondary air supply means.

4,450,681

CARBON PARTICULATES CLEANING DEVICE FOR DIESEL ENGINE

Susumu Sato, Okazaki; Yukihisa Takeuchi, Aichi; Masahiro Tomita, Anjo; Shigeru Kamiya, Chiryu, and Shigeru Takagi, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 480,381, Apr. 5, 1983, abandoned, which is a continuation of Ser. No. 238,623, Feb. 26, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,210
Claims priority, application Japan, Mar. 4, 1980, 55-27164
Int. Cl.³ F01N 3/02
U.S. Cl. 60—286 13 Claims

1. A carbon particulates cleaning device for catching and cleaning carbon particulates contained within an exhaust gas discharged from a diesel engine of an automobile or the like through an exhaust gas passage, comprising:

a carbon particulates catching means which is disposed within said exhaust gas passage for catching said carbon particulates contained within said exhaust gas;

a carbon particulates volume detecting means for detecting

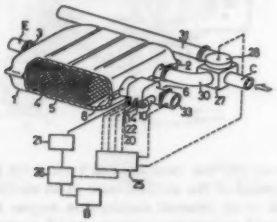
the volume of carbon particulates caught by said carbon particulates catching means and generating an electrical signal when the volume of carbon particulates reaches a predetermined volume;

a fuel injecting means for injecting fuel near said carbon particulates catching means for a predetermined period of time;

a fuel retaining means which is provided near said carbon particulates catching means for retaining the fuel injected by said fuel injecting means;

a fuel igniting means which is provided near said fuel retaining means for igniting the fuel retained by said fuel retaining means;

a fuel ignition detecting means which is provided near said fuel retaining means for detecting that the fuel retained by said fuel retaining means is ignited by said fuel igniting means and generating an electrical signal while the fuel retained by said fuel retaining means burns;



a gas blowing means which is provided near said fuel retaining means for blowing gas containing oxygen into the fuel ignited by said fuel igniting means in order to maintain the burning of said fuel after the operation of said fuel igniting means is finished and applying burning heat of the ignited fuel to said carbon particulates caught by said carbon particulates catching means; and

a control means which is electrically connected to said carbon particulates volume detecting means, said fuel ignition detecting means, said fuel injecting means, said fuel igniting means and said gas blowing means;

said control means being constructed so as to start the operation of said fuel injecting means and said fuel igniting means upon receiving said electrical signal from said carbon particulates volume detecting means, and stop the operation of said fuel igniting means while starting the operation of said gas blowing means upon receiving said electrical signal from said fuel ignition detecting means.

4,450,682

CARBON PARTICULATES CLEANING DEVICE FOR DIESEL ENGINE

Susumu Sato, Okazaki; Yukihisa Takeuchi, Aichi; Masahiro Tomita, Aajo; Shigeru Kamiya, Chiryu, and Shigeru Takagi, Aajo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 480,379, Apr. 5, 1983, abandoned, which is a continuation of Ser. No. 235,722, Apr. 18, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,527

Claims priority, application Japan, Feb. 18, 1980, 55-18891; Feb. 25, 1980, 55-22363

Int. Cl.³ F01N 3/02

U.S. Cl. 60—286 **11 Claims**

1. A carbon particulates cleaning device for cleaning the carbon particulates contained in the exhaust gas discharged from a diesel engine of an automobile or the like, comprising:

an exhaust gas passage adpated to be communicated with an exhaust manifold of a diesel engine;

said exhaust gas passage being formed by an exhaust gas main pipe and an exhaust gas branch pipe which is diverged from said exhaust gas main pipe;

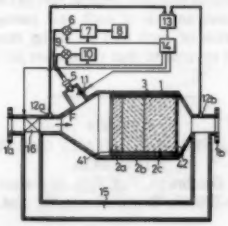
a carbon particulates catching member which is provided within at least one of said exhaust gas main pipe and said exhaust gas branch pipe;

said carbon particulates catching member being composed of a plurality of ceramic foamed bodies which are arranged in the exhaust gas flowing direction so that opposed end surfaces of each ceramic foamed body are closely contacted with each other, the length of the upstream ceramic foamed body being shorter than that of the downstream ceramic foamed body;

a valve means which is provided in the portion where said exhaust gas branch pipe is diverged from said exhaust gas main pipe for selectively supplying said exhaust gas into said exhaust gas main pipe or said exhaust gas branch pipe;

a heating means which is provided adjacent to the upstream end of said carbon particulates catching member on the upstream side thereof for applying heat to said carbon particulates catching member so as to burn the carbon particulates caught by said carbon particulates catching member;

a gas supplying means which is provided in at least one of said exhaust gas main pipe and said exhaust gas branch pipe, adjacent to said heating means on the upstream side thereof for supplying gas into said carbon particulates catching member;



a carbon particulates volume detecting means which is provided in at least one of said exhaust gas main pipe and said exhaust gas branch pipe for detecting the volume of the carbon particulates caught by said carbon particulates catching member and which generates electrical signals when the volume of caught carbon particulates reaches a predetermined volume; and

a control means which is electrically connected to said carbon particulates volume detecting means, said valve means, said heating means and said gas supplying means for supplying electrical signals to said valve means, said heating means and said gas supplying means upon receiving said electrical signals from said carbon particulates volume detecting means so as to start the operation of said valve means, said heating means and said gas supplying means;

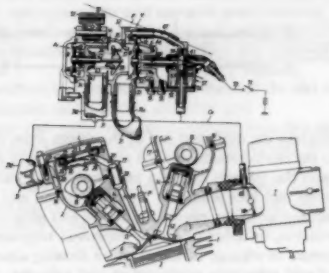
whereby when the volume of the carbon particulates caught by said carbon particulates catching member reaches a predetermined volume, said valve means closes said exhaust gas passage leading to said carbon particulates catching member and opens another exhaust gas passage, said heating means applies heat to the upstream end of said carbon particulates catching means for a predetermined time and said gas supplying means supplies gas into said heating means until the carbon particulates caught by said carbon particulates catching member are burnt off.

4,450,683

EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yasuo Ikenoya, Kawagoe, and Yoichi Ishida, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,548
Claims priority, application Japan, Aug. 24, 1981, 56-132410
Int. Cl.³ F02B 75/10; F01N 3/22
U.S. Cl. 60—290 5 Claims



1. An exhaust gas cleaning system for an internal combustion engine having an exhaust system including a TWC catalyst, said exhaust gas cleaning system comprising:

(a) a secondary air supply passage means coupled to said exhaust system on the upstream side of said TWC catalyst for supplying secondary air to said exhaust system;

(b) a secondary air control valve means positioned in said secondary air supply passage means for regulating the flow of secondary air therethrough, said secondary air control valve means comprising:

(i) a unitary valve casing;

(ii) a valve passage means in said valve casing coupled to said secondary air supply passage means;

(iii) first and second control valve means for separately opening and closing said valve passage means, said first control valve means being closed when said engine is decelerating and said second control valve means being closed when said engine is accelerating or operating at a high speed, thereby maintaining said TWC catalyst as a reducing atmosphere.

4,450,684

EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Junji Otani, Oomiya; Yasuo Ikenoya, Kawagoe, and Hiroshi Kato, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,024
Claims priority, application Japan, Aug. 24, 1981, 56-132413
Int. Cl.³ F02B 75/15; F01N 3/22
U.S. Cl. 60—290 3 Claims

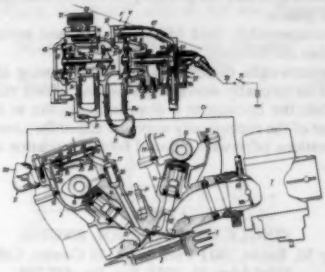
1. An exhaust gas cleaning system for an internal combustion engine having an exhaust system leading to an exhaust port of an engine body, said exhaust gas cleaning system comprising:

a TWC catalyst disposed in the exhaust system for simultaneously cleaning HC, CO and NO_X exhaust gas flowing through the exhaust system;

a secondary-air supply passage means connected to the exhaust system on the upstream side of the TWC catalyst and coupled to the atmosphere;

a check valve means disposed in the secondary-air supply passage, wherein said check valve means is opened by the exhaust gas pulsation generated in the exhaust system; and

a secondary-air control valve means positioned in the secondary-air supply passage means on the upstream side of said check valve means, wherein said secondary-air control valve means increases the flow rate of the secondary air supplied to said exhaust system in the low-speed revolution range of the engine and decreases the flow rate of the secondary air supplied to said exhaust system in the accelerating and high-speed revolution ranges of the engine such that the atmosphere of said TWC catalyst becomes oxidative in the low-speed revolution range of the engine while the catalyst atmosphere becomes close to that of a stoichiometric ratio in the accelerating and high-speed revolution ranges.

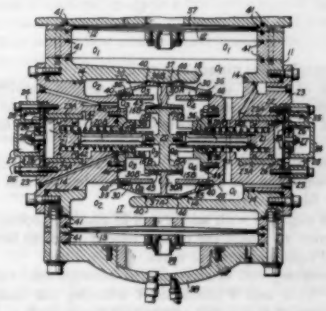


4,450,685

DYNAMICALLY BALANCED, HYDRAULICALLY DRIVEN COMPRESSOR/PUMP APPARATUS FOR RESONANT FREE PISTON STIRLING ENGINES

John A. Corey, North Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 2, 1982, Ser. No. 384,304
Int. Cl.³ F02G 1/04
U.S. Cl. 60—520 27 Claims



1. Apparatus for use in conjunction with a periodically pressurized fluid drive source; said apparatus comprising a housing having a first side closed by a first flexible diaphragm designed to be exposed to the periodically pressurized fluid drive source and a second side opposite the first side closed by a second flexible diaphragm that comprises part of a gas spring, said housing having a bore extending therein which is transverse to the axial direction of movement of the first and second flexible diaphragms and forming a cylinder within the housing, a reciprocally movable piston disposed in said cylinder which reciprocally moves along an axis that is substantially at right angles relative to the direction of axial movement of the first and second flexible diaphragms, said cylinder having a first port formed therein comprising means for providing fluid drive coupling between a first side of the reciprocally movable piston and a first fixed volume space within the housing ex-

posed to the first flexible diaphragm, a second port formed in said cylinder comprising means for providing fluid drive coupling between the second side of the reciprocally movable piston and a second fixed volume space formed within the housing exposed to the second flexible diaphragm, at least one working member of a compressor, pump or other like apparatus connected to and reciprocally driven by said reciprocally movable piston,

an incompressible fluid filling the first and second spaces within the housing, and

a counterweight disposed within said housing along with said reciprocally movable piston and which reciprocates within the housing in a direction opposite to the movement of the reciprocally movable piston for cancelling out vibrations otherwise induced by reciprocation of the piston.

4,450,686

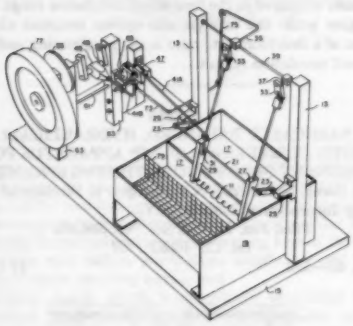
SINGLE WIRE NITINOL ENGINE

Ridgway M. Banks, 7411 Park Vista, El Cerrito, Calif. 94530

Filed Mar. 21, 1983, Ser. No. 477,258

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—527 **6 Claims**



1. A single wire nitinol engine comprising

a pair of levers, one being fixed against movement with respect to the other, the other being formed to have one end thereof reciprocate in straight line motion toward and away from said fixed lever,

a nitinol wire formed in the configuration of a spring secured between the end of the reciprocatable lever and the end of the fixed lever,

means engaged with said levers to also reciprocate the ends thereof to which the nitinol wire is attached between hot and cold temperature baths,

a connecting rod interconnected between said reciprocatable lever and a crank shaft whereby the reciprocating motion of said lever rotates said crank shaft.

4,450,687

TEMPERATURE RESPONSIVE ACTUATING DEVICE

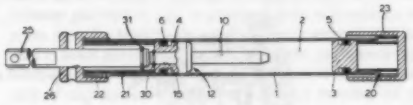
Albert Cole, Keswick, England, assignor to Thermoforce Limited, Cockermouth, England

Continuation of Ser. No. 130,730, Mar. 17, 1980, abandoned. This application May 25, 1982, Ser. No. 381,689

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—530 **5 Claims**

1. A temperature responsive control device which utilizes a wax based substance which has liquid properties and a high coefficient of expansion, which substance is located, without provision for replenishment in service within a cylinder between two end plugs, both end plugs being equipped with peripheral sliding seals engaging with the wall of the cylinder and both end plugs being adjustable axially of the cylinder, a piston passing through one of the end plugs and having one end immersed in said substance and its other end operatively connected by way of a high leverage operating linkage with a first load element, the cylinder being connected to a second load element, the device effecting relative movement between said load elements with changes of temperature, with the piston being slidable in a shaft seal in the end plug through which it passes, and wherein, in order to prevent reduction of the sealing efficiency of the peripheral seal and of the shaft seal of that end plug through which it passes means are provided



for shielding the outboard end of the piston from direct exposure to the environment, and the piston bears with its outboard end upon the inboard end of a push rod which can be moved separately and independently from the piston and which can transmit forces to the piston and to the end plug only axially, and wherein, in order to obtain improved response upon the occurrence of change of temperature causing change of volume of said substance contained in said cylinder, the bore of said cylinder is at least three times greater in diameter than said piston rod.

4,450,688

BRAKE BOOSTER FOR AUTOMOTIVE VEHICLES

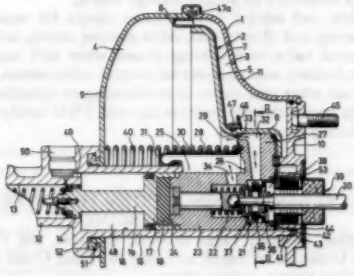
Peter Boehm, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 3, 1981, Ser. No. 270,077

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025314

Int. Cl.³ B60T *13/20*; **F01B** *19/04*; **F15B** *9/10*

U.S. Cl. 60—554 **16 Claims**



1. A brake booster for automotive vehicles comprising:

a low-pressure casing having a longitudinal axis and two spaced end walls in a transverse relationship with said axis, said casing being sealingly subdivided into a low-pressure chamber and a working chamber by an axially movable wall disposed coaxial of said axis;

a reinforcement tube coaxial of said axis extending axially through said casing to interconnect said two end walls and in a slideable sealed relationship with said movable wall, said tube being integrally formed with a housing of a master cylinder having an actuating piston disposed coaxial of said axis and guided in said housing, said housing being secured to that one of said two end walls adjacent said low-pressure chamber;

a control valve casing disposed in said tube coaxial of said axis, said control valve casing being axially movable in said tube and including therein a mechanically actuatable

control valve to connect said working chamber to a selected one of said low-pressure chamber and atmosphere;

a guide piston disposed in said tube coaxial of said axis connected to said actuating piston, said guide piston being axially movable in said tube;

an elastic reaction disc disposed in said tube coaxial of said axis between said control valve casing and said guide piston; and

at least two spaced radial ribs each fastened to said control valve casing extending radially through a different one of at least two longitudinal slots of said tube to connect said control valve casing to said movable wall wherein,

said guide piston adjacent said control valve casing has a cup-like construction to accommodate said reaction disc, wherein

each of said two longitudinal slots are open at the end of said tube adjacent said working chamber, and

each of said two radial ribs are connected to a ring encompassing said tube and sealingly secured to said movable wall, and wherein

the end of said tube adjacent said working chamber is threaded and is in engagement with a thread in that one of said two end walls adjacent said working chamber.

4,450,689
ARRANGEMENT IN OR RELATING TO A POWER PLANT

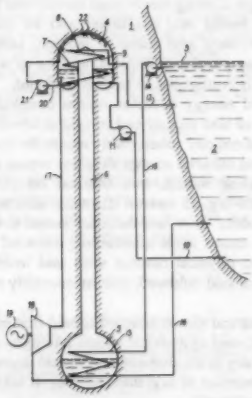
Per H. Moe, Amtm. Bangsgt. 7, N-3000 Drammen, Norway

PCT No. PCT/NO80/00016, 371 Date Jan. 5, 1982, 102(e) Date Jan. 5, 1982, PCT Pub. No. WO81/03360, PCT Pub. Date Nov. 26, 1981

PCT Filed May 14, 1980, Ser. No. 339,432

Int. Cl.³ F03G 7/04

U.S. Cl. 60—641.7 7 Claims



1. A power plant arrangement for exploiting the temperature difference between different water layers in a pelagic area, comprising:

a closed system which is at least partially filled with a fluid which at least partially exists in the liquid phase,

said system comprising at least two heat exchanging apparatuses in fluid communication with each other,

one of said heat exchangers being in communication with a relatively warmer water layer of the pelagic area for supplying heat to the said fluid, and the other heat exchanger being in communication with a relatively colder water layer of the pelagic area for removing heat from the said fluid, whereby a pressure difference is created in the system which is utilized to take energy out of the system,

each of said first and second heat exchanging apparatuses being arranged in respective chambers which are comprised of cavities in solid or consolidated rock.

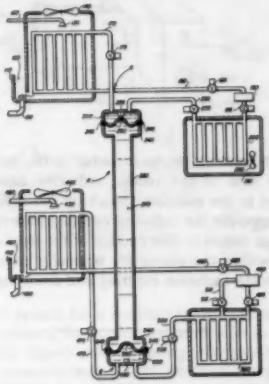
4,450,690
THERMALLY POWERED, GRAVITATIONALLY ASSISTED HEAT TRANSFER SYSTEMS

Robert W. Clark, Jr., 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

Filed Jan. 10, 1983, Ser. No. 456,592

Int. Cl.³ F25B 1/00

U.S. Cl. 62—116 15 Claims



1. A thermally powered heat transfer system having a first and a second cycle of operation, comprising:

first and second closed loop heat transfer means including respectively a first and a second refrigerant, a first and a second condenser means for transferring heat from the first and second refrigrant to a first and a second heat sink, and a first and a second heat exchanger means for transferring heat from a first and a second heat source to the first and second refrigerants;

compressor means for said first and second closed loop heat transfer means including a first chamber, a second chamber and a free piston common to both chambers, said first chamber being at a higher elevation than the second, said compressor means being powered by energy derived from the first heat source and gravity acting on said free piston for compressing the second refrigerant in the second chamber and for causing the second condenser means to transfer heat from the second refrigerant to the second heat sink during each first cycle of operation and being powered by energy derived from the second heat source acting on said free piston for compressing the first refrigerant in the first chamber and causing the first condenser means to transfer heat from the first refrigerant to the first heat sink during each second cycle of operation; and

control means for causing the system to change its cycle of operation substantially at the completion of each cycle.

4,450,691
FROST DETECTING DEVICE

John H. Taylor, Lachine, Canada, assignor to Dectron Inc., Montreal, Canada

Filed Oct. 19, 1982, Ser. No. 435,286

Int. Cl.³ F25D 21/02; H01J 5/02

U.S. Cl. 62—140 7 Claims

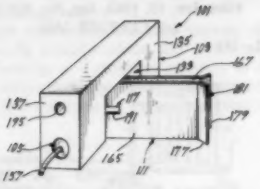
1. A frost detecting device having:

a mounting block, the mounting block having one side face which is meant to be mounted against the edges of a plurality of refrigeration fins;

a recess in the mounting block between its ends, the recess

extending inwardly into the mounting block from the one side face and located below the top face of the mounting block;

frost accumulating means fixed to the mounting block within the recess and projecting transversely outwardly from the recess past the one side face of the mounting block for surface contact with one of the refrigerator fins;



a radiation emitting means mounted in the mounting block on one side of the recess; radiation detecting means mounted in the mounting block on the other side of the recess opposite the radiation emitting means;

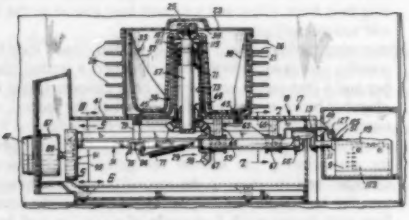
and passage means in that portion of the frost accumulating means within the recess for normally passing radiation between the radiation emitting and detecting means.

4,450,692

APPARATUS FOR MAKING FROZEN FOOD PRODUCTS

Verlos G. Sharpe, and David G. Beers, both of Galesburg, Ill., assignors to Magic Chef, Inc., Cleveland, Tenn.

Filed Sep. 30, 1982, Ser. No. 430,846
Int. Cl.³ A23G 9/00
U.S. Cl. 62—233 **18 Claims**



15. An apparatus for making a frozen food product in the freezer compartment of a refrigerator having an existing ice dispenser unit that is detachable from the drive shaft of a motor for driving same, which apparatus comprises:

(a) a housing for containing a frozen food product mix;

(b) means disposed within the housing for stirring the mix;

(c) a drive assembly for detachably connecting the apparatus to the ice dispenser unit drive motor for stirring the mix by the drive motor; and

(d) a timer assembly for actuating the drive motor to operate same for a predetermined period of time and including:

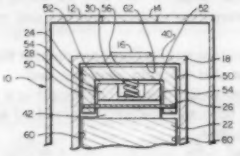
1. a timer mechanism for establishing a preset period of time,
2. a cam carried by the timing mechanism and rotated by same during the preset period of time,
3. a plunger engageable by the cam, and
4. a switch assembly actuated by the plunger for connecting and disconnecting the ice dispenser unit drive motor to and from a power source.

4,450,693

CRYOGENIC COOLER THERMAL COUPLER

Kenneth E. Green, Westford, and John A. Talbourdet, Danvers, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 24, 1983, Ser. No. 497,779
Int. Cl.³ F25B 19/00
U.S. Cl. 62—514 R **8 Claims**



1. An infrared energy receiver for measuring infrared energy from a scene of interest, said receiver comprising:

A. coldfinger cooling means having a first end;

B. a coldwell having an inner diameter greater than the outer diameter of said coldfinger cooling means, the difference in diameters of said coldfinger cooling means and said coldwell sufficient to enable said coldfinger cooling means to fit within said coldwell, said coldwell having a second end in a spaced relationship with said first end of said coldfinger cooling means, said second end having an inner surface facing said coldfinger and an outer surface directed toward said scene of interest, said coldwell also having an interior cylindrical surface to which said inner surface is contiguous at said second end;

C. infrared energy detector means coupled to said outer surface of said second end of said coldwell;

D. thermal coupler subassembly means for transmitting heat from said infrared energy detector means to said coldfinger cooling means, said thermal coupler subassembly means having an overall diameter selected to maximize heat transfer from said detector means to said coldfinger cooling means while maintaining a spaced relationship to minimize physical contact with said interior cylindrical surface of said coldwell, said subassembly means comprising:

(i) cylindrical means coupled to said first end of said coldfinger, said cylindrical means having a depression substantially in the shape of a well, said depression facing in the direction of said inner surface of said second end of said coldwell;

(ii) a "U"-shaped cap having an outer diameter the same as the diameter of said coupler subassembly means, and an inner diameter substantially the same as the diameter of said cylindrical means such that said cap and said cylindrical means are in a spaced relationship providing thermal transfer and ease of relative motion while minimizing physical contact; and

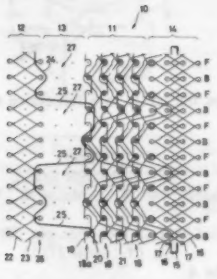
(iii) spring means placed in said depression of said cylindrical means, said spring means positioned between said cylindrical means and said cap in order to maintain thermal transfer between said cap and said inner wall of said coldwell, the tension of said spring means selected to minimize transmission of vibration from said coldfinger cooling means to said detector means while providing said thermal transfer.

4,450,694

WARP-KNIT STRINGER TAPE FOR SLIDE FASTENER

Yoshio Matsuda, Uwano Nyuzen; Masahiko Hata, Tokyo, and Toru Ogihara, Funabashi, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,362
Claims priority, application Japan, Dec. 9, 1980, 55-176403
Int. Cl.³ D04B 23/08, 23/10
U.S. Cl. 66—193 4 Claims



1. A double warp-knit stringer tape for a slide fastener suitable for a knit fabric and having a pair of rows of coupling elements, comprising:

(a) an elongate first web for supporting along one longitudinal edge thereof one coupling element row of the slide fastener;

(b) an elongate second web for being joined to the knit fabric, said web being spaced transversely from said first web with a wale-free coarse region therebetween which second web and coarse region are both remote from said coupling element supporting edge of said first web; and

(c) a connector thread interconnecting said first and second webs across said wale-free coarse region;

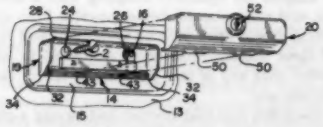
(d) said second web being double knit as a compact round braid-like structure for being attached to and stabilizing the knit fabric.

4,450,695

ANTI-THEFT DEVICE FOR AUTOMOBILE TOPS

Nick Graziano, 1800 N. Sayre, Chicago, Ill. 60635

Filed Nov. 20, 1981, Ser. No. 323,231
Int. Cl.³ B65D 55/14
U.S. Cl. 70—168 5 Claims



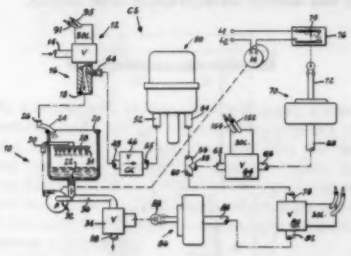
1. An anti-theft device for preventing the unauthorized removal of a T-top roof section having a handle actuated latching means for fastening the T-top to an automobile, said device comprising a base plate having a base panel outwardly projecting top and side flanges, said base plate being fastened to said T-top and encompassing said handle, a groove along the lower edge of said base plate extending between said side flanges, a cover including a cover panel and a top flange and side flanges complementary to said base top and side flanges to form an enclosure therewith and including a bottom flange having an edge portion seatable within said groove, a key operated lock means mounted on said cover and including a locking plate movable between a release position above said T-top handle and a latch position disposed between said T-top handle and base panel whereby said handle is enclosed by said cover and inaccessible until said key operated lock means is actuated to a release position.

4,450,696

VENTURI POWER SUPPLY AND ACTUATOR SYSTEM

Keith E. Zukausky, Hanover, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 22, 1982, Ser. No. 400,780
Int. Cl.³ D06F 33/08
U.S. Cl. 68—18 FA 12 Claims



1. A control system for a washing appliance comprising:

(a) a valve adapted for connection at its inlet to a source of pressurized liquid and including electrically operated actuator means operative upon electrical energization and de-energization to effect opening and closing of said valve;

(b) means defining a venturi having a converging inlet, a throat and an outlet diffuser with the inlet thereof connected to the outlet of said valve for receiving fluid flow therefrom;

(c) pressure tap means defining a fluid port in the throat of said venturi;

(d) receptacle means for receiving the articles to be washed;

(e) conduit means operatively connected for directing fluid from the venturi outlet diffuser to said receptacle means;

(f) one-way valve means having the inlet thereof connected to said venturi throat port;

(g) means defining a fluid pressure reservoir having an inlet including means connecting said reservoir to the outlet of said one-way valve means;

(h) fluid pressure servo-actuator means having a pressure signal inlet connected to receive the fluid pressure in said reservoir, said servo-actuator having an output member and operative to provide an output force and movement of said member in response to a fluid pressure signal from said reservoir; and,

(i) electrically operated valve means for controlling flow between said reservoir and said servo-actuator means.

4,450,697

SECURITY DEVICES FOR ROTATABLE MEMBERS AND FLUID FLOW CONTROL VALVES INCORPORATING SUCH DEVICES

Alan E. H. Ellis, 14 Scott Dr., Lexden, Colchester, England

Filed Sep. 10, 1981, Ser. No. 300,907
Int. Cl.³ G05G 5/00
U.S. Cl. 70—178 17 Claims

1. A security arrangement for a rotatable member of a machine element which projects from the machine element, which security arrangement is adapted to be fitted to the machine element and comprises:

a rotatable stub for attachment to the rotatable member to impart rotational drive thereto,

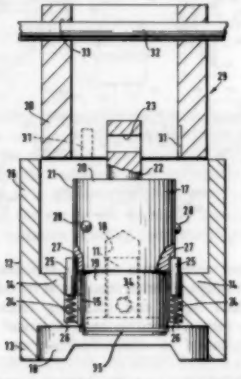
means for attaching the stub to the rotatable member and for securing the so-attached stub against axial movement with

respect to the machine element, the stub defining an external cylindrical surface and there being at least two arcuately spaced projections upstanding radially from said cylindrical surface,

a shroud adapted to surround with clearance said cylindrical surface of the stub and said projections upstanding therefrom, and

means for releasably attaching the shroud to the rotatable stub for permitting relative rotational movements therebetween while securing the shroud against axial movement with respect to the stub,

the shroud being provided with means to secure said shroud against rotation with respect to said machine element when said security arrangement is fitted thereto,



and said means for attaching the stub to the rotatable member and for securing the so-attached stub against such axial movement as well as said means for releasably attaching the shroud to the stub being located internally of the shroud,

whereby said stub may be engaged by an operating key having a cylindrical portion defining a bore which may fit over said cylindrical surface, said key also having wall portions defining recesses angularly spaced for receiving said projections and the outer diameter of said cylindrical portion of the key being sufficiently small to fit within said shroud, so that rotation of the stub may be effected by the key driving the stub by the interengagement of at least one of the projections with at least one corresponding wall portion of said key defining at least one corresponding recess receiving said projection.

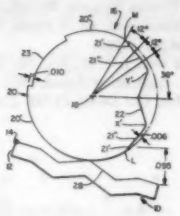
4,450,698

COMBINATION LOCKS

Stephen S. Scelba, Clifton, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Feb. 16, 1982, Ser. No. 348,715
Int. Cl.³ E05B *37/02, 63/00*
U.S. Cl. 70—312 **9 Claims**

1. A combination lock having a locking member movable between locking and unlocking positions, a plurality of rotary elements for controlling the position of the locking member by peripheral cooperation of the respective elements with the locking member, each rotary element having a periphery including a major portion and a minor portion, the major portion holding the locking member in locking position when the element is suitably rotated with any point on the major portion engaging the locking member, the major portion comprising a central section disposed on an arc defining a part of a circle and end sections connecting the major portion to opposite ends respectively of the minor portion, the minor portion being disposed within said circle and when suitably mutually aligned with the minor portions of the other rotary elements, allowing the locking member to assume an unlocking position, the ends of the minor portion being spaced inwardly of said circle and the end sections of the major portion each extending inwardly



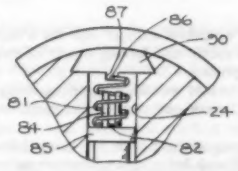
from a point on the circle to a respective end of the minor portions.

4,450,699

PIN TUMBLER LOCK

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01606

Filed Mar. 2, 1981, Ser. No. 239,400
Int. Cl.³ E05B *27/02*
U.S. Cl. 70—364 A **9 Claims**



1. A lock comprising:

housing means defining a keyway and a plurality of tumblerways communicating therewith;

a tumbler disposed in each of said tumblerways and adapted for both reciprocating and rotational movement therein, each of said tumblers movable between locked positions into at least one shear position comprising both a predetermined longitudinal position and a predetermined angular position within its said tumblerway, each of said tumblers comprising one end surface defining an alignment surface extending into said keyway;

rotational bias means biasing each of said tumblers into biased angular positions other than said predetermined angular positions;

release means movable between open and closed positions and adapted for operative coupling with a latch mechanism, said release means being movable from said closed position to said open position with all of said tumblers in said shear positions and being restrained in said closed position with any of said tumblers in one of said locked positions; and

a key insertable into said keyway and having a plurality of alignment portions, each of which is adapted to engage a different one of said alignment surfaces, the elevation and orientation of said alignment portions and surfaces being such as to move said tumblers into their shear positions.

4,450,700

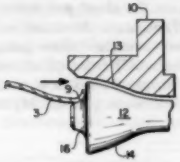
METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINER BODIES

Field I. Robertson, Jr., Midlothian, and George D. Bryan, Jr., Mechanicsville, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 15, 1982, Ser. No. 441,688
Int. Cl.³ B21D *19/04*
U.S. Cl. 72—115 **10 Claims**

1. Apparatus for necking and flanging a metallic can body comprising a stationary outer die member and a rotatable inner

die member, said outer die member having a working surface corresponding to the desired necked configuration for said can body, said inner die member having a working surface corresponding to the desired necked configuration for said can body and a flanging surface on a nose portion thereof, said inner die



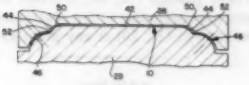
member being mounted for driven rotation about the axis of said outer die member, said inner die member being mounted for free-wheeling rotation about its axis and said inner die member being mounted for radial movement within said outer die member.

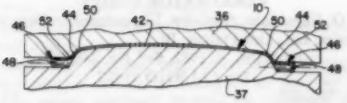
4,450,701

METHOD OF FORMING SLATS FOR VENETIAN BLINDS

Josef Treiber, Graz, and Walter Reichmann, Stainz, both of Austria, assignors to Metallbau Treiber KG, Graz, Austria

Filed Mar. 1, 1982, Ser. No. 352,888
Claims priority, application Austria, Oct. 20, 1981, 4474/81
Int. Cl.³ B21D *5/08*
U.S. Cl. 72—181 **14 Claims**





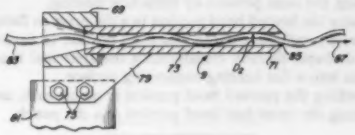
1. A method of forming baked enameled sheet metal slats for venetian blinds and the like comprising the steps of first bending an elongated sheet metal strip which has been baked enameled on both sides thereof, to form a longitudinal body section, a pair of substantially symmetrical longitudinal ribs and a pair of substantially symmetrical longitudinal edge sections in said strip, said strip being formed so that when it is in a substantially horizontal disposition said ribs extend outwardly and downwardly from the side edges of said body section and said edge sections extend outwardly from said ribs; and thereafter gradually bending said edge sections in a plurality of gradual bending increments in longitudinal progression so that when said strip is in a substantially horizontal disposition said edge sections are gradually bent downwardly and inwardly upon themselves to form marginal edges of substantially U-shaped cross section, the dispositions of said ribs relative to said body section being maintained substantially unchanged after the initial formation of said ribs, said entire method being carried out without bending an area of said strip first in one direction and thereafter in an opposite direction to avoid the formation of stress cracks in said enamel.

4,450,702

COBBLE SUPPRESSING MEANS

Duane B. Larson, Williamsville, and Richard J. Westermeier, Hamburg, both of N.Y., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Filed Nov. 23, 1982, Ser. No. 444,257
Int. Cl.³ B21B *39/14*
U.S. Cl. 72—250 **5 Claims**



1. In a rolling mill having a final roll stand, a pouring reel downstream from said final roll stand for receiving rod product of a diameter (D) issuing from said final roll stand, said pouring reel having an entry guide pipe assembly, having an internal diameter (D_1), for guiding said product into said pouring reel, and a water cooling means intermediate said final roll stand and said pouring reel for cooling said product, the improvement comprising:

(a) cobble suppressing means intermediate said water cooling means and said entry guide pipe assembly for suppressing cobbles;

(b) said cobble suppressing means having an outwardly flaring entry end, a downstream exit end and a longitudinal tubular body having an internal diameter (D_2) intermediate said entry end and said exit end;

(c) the internal diameters of said entry guide pipe assembly and said tubular body characterized by the relationship $D_1 \geqq 2.5\ D_2$; and

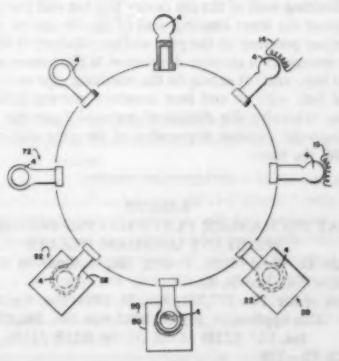
(d) the internal diameter of said tubular body and the diameter of said product characterized by the relationship $D_2 > D$ but $\leqq 3$ D.

4,450,703

ROD ENDS AND BLANKS AND METHOD AND APPARATUS FOR MAKING SAME

John A. McCloskey, Fairfield, Conn., assignor to Incom International Inc., Pittsburgh, Pa.

Filed Jan. 14, 1981, Ser. No. 224,876
Int. Cl.³ B21D *37/16*
U.S. Cl. 72—342 **26 Claims**



1. A method of making rod ends having at one end thereof tapped rod portions and at the opposite end bearing supporting surfaces comprising

providing rod stock,

forming a rod end blank from said rod stock, said blank having a tapped rod portion at one end of desired size and shape terminating at the opposite end in a radially undersized spherical head portion, said rod portion being necked adjacent the head portion and being provided with an axial threaded bore,

plugging the threaded bore prior to heating the head portion to prevent distortion of said threaded bore by said heating and pressing,

heating the head portion by induction heating,

pressing the heated head portion in a die press to flatten and thereby radially enlarge said head portion to desired size and shape, thereby transforming the spherical head portion into a flat bearing supporting surface,

quenching the pressed head portion in an oil bath, and

piercing the quenched head portion in a die punch.

4,450,704

METAL SLEEVE PRODUCTION

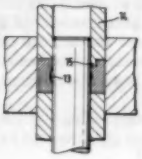
Georg Schaeffler; Karl Spiess, both of Herzogenaurach; Jürgen E. Heyne, Saarbrücken, and Manfred Krost, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Motomak Motorenbau, Maschinen- Und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,636

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203438

Int. Cl.³ B21B *22/00*

U.S. Cl. 72—356 **1 Claim**



1. A method of producing a metal sleeve having at least one recess open at the end face extending over a portion of the axial length of the sleeve from a cylindrical pipe section comprising (a) inserting a cylindrical pipe section into the annular cavity of a die which cavity is radially greater than the wall thickness of the pipe section, (b) subjecting the pipe section to axial ram pressure whereby a bulge in the central portion of the pipe section occurs with the central portion bearing against the outer limiting wall of the die cavity and the end portions bearing against the inner limiting wall of the die cavity, (c) applying further pressure on the pipe section whereby it fills the die cavity except for a circular depression in the center of the pipe section bore and (d) acting on the resulting pipe section with a second ram with an end face contours corresponding to the recesses whereby the displaced material from the contours enter into the circular depression of the pipe section to partially fill the same.

4,450,705

HEAT EXCHANGER PLATE HAVING DISTORTION RESISTANT UNIFORM PLEATS

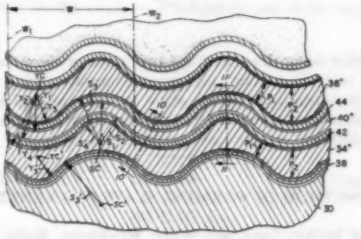
Gonzalo D. Vidal-Meza, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 277,742, Feb. 18, 1981, Pat. No. 4,346,760. This application Jun. 9, 1982, Ser. No. 386,658

Int. Cl.³ B21D *13/02, 53/04;* **B21P** *15/26*

U.S. Cl. 72—379 **7 Claims**

1. A method for forming a heat exchanger plate (2, 4, 6, 8) for use as a barrier between donative and recipient fluids flowing through the heat exchanger and for forming fluid flow passages (18, 20) within the plate (2, 4, 6, 8) arranged to cause heat transfer through the plate (2, 4, 6, 8) from the donative fluid to the recipient fluid, and said method includes the steps of (1) bending a sheet (37) of ductile heat conductive material to form an undulatory pleat (12) containing a donative fluid flow passage (20) bounded on opposed sides in plan view by a pair of side walls (38, 42, 44) formed from the sheet (37) of ductile heat conductive material and having a central axis in plan view extending along a continuous curvilinear path between separate points on the sheet perimeter, (2) bending a portion of the sheet (37) adjacent the donative fluid flow passage (20) to form a recipient fluid flow passage (18) on an opposite side of the sheet (37) from the donative fluid flow passage (20) with the recipient fluid flow passage (18) being bounded by a pair of side walls (38, 42, 44) one of which is



shared with said donative fluid flow passage and having a central axis in plan view extending along a continuous curvilinear path between separate points on the sheet perimeter, and (3) repeating steps (1) and (2) to form a set of donative fluid flow passages (20) on one side of the sheet (37) and a set of recipient fluid flow passages (18) on the opposite side of the sheet (37), each flow passage (18, 20) sharing a common side wall (38, 42, 44) with the adjacent fluid flow passages (18, 20), wherein the improvement comprises controlling bending steps (1) and (2) in a way to cause the slope of each side wall (38, 42, 44) of each flow passage (18, 20) to be constant along the entire length of the flow passage (18, 20), wherein the slope is measured in a plane perpendicular to the central axis of the corresponding flow passage (18, 20) at any point along said axis.

4,450,706

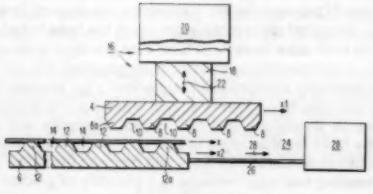
METHOD AND APPARATUS FOR FORMING COLLIMATOR STRIPS

Gustav O. Engelmohr, Glenview, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Feb. 8, 1982, Ser. No. 346,917

Int. Cl.³ B21D *13/02*

U.S. Cl. 72—385 **12 Claims**



1. An apparatus for forming a profiled collimator strip out of a band of a deformable material, comprising

(a) a first forming tool having a first end face containing a first plurality of teeth along a first plane;

(b) a second forming tool having a second end face containing a second plurality of teeth along a second plane, whereby said second end face is arranged opposite and parallel to said first end face, and whereby said second

plurality of teeth has the same pitch as and is staggered with respect to said first plurality of teeth;

(c) means for performing relative movements between said first and second tools parallel to said first and second planes when said first tool is in said retracted position, said relative movements being indexing step by step movements in the same direction; and

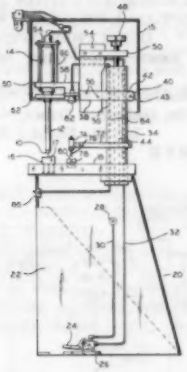
(d) means for performing relative movements between said first and second tools, said relative movements comprising a closing movement whereby one of said tools moves from a retracted position linearly towards the other one of said tools until a forming position is reached, and said movements comprising an opening movement which is in opposite direction with respect to said closing movement.

4,450,707

HARDENED METAL WORKPIECE STRAIGHTENING MACHINE

Paul R. Ricard, and Charles Goclowski, both of Monroe, Conn., assignors to Arrow Machine, Inc., Monroe, Conn.

Filed Jun. 14, 1982, Ser. No. 387,821
Int. Cl.³ B21D *3/10*
U.S. Cl. 72—389 **5 Claims**



1. An apparatus for straightening the curvature in a hardened metal workpiece comprising:

a rigid support surface for supporting said workpiece;

a source of air under pressure;

pneumatically operated peen chisel means disposed above said support surface including an air hammer having a peen chisel mounted therein for repeated reciprocal movement by said air hammer for repeatedly striking said workpiece as said workpiece is supported in the path of said peen chisel, said peen chisel located above said support surface and said workpiece, and said source of air pressure being operably connected to said air hammer;

control means operably connected between said source of air pressure and said air hammer to selectively and infinitely vary the amount of air under pressure delivered to said air hammer;

a vertical column mounted on said support surface;

mounting bracket means disposed for vertical movement along the length of said vertical column;

said air hammer supported by said mounting bracket means;

adjusting means operably connected between said vertical column and said mounting bracket means to vary the position of said mounting bracket means and said air hammer relative to said vertical column;

said adjusting means comprising a shaft having external threads extending along the length of said column and mounted for rotation relative to said support surface;

means to rotate said externally threaded shaft;

additional bracket means having an internally threaded aperture therein whereby said externally threaded shaft extends through said aperture and said threads to form a driving relationship;

said additional bracket means fixed to adjusting rail means extending partially along the length of said column;

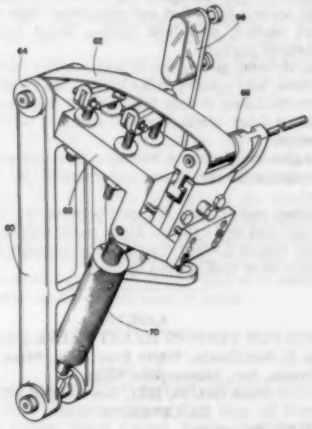
said adjusting rail means fixed to said mounting bracket means whereby rotation of said externally threaded shaft moves said air hammer in a vertical direction.

4,450,708

UNIVERSAL, ADJUSTABLE BENDING FORM FOR SHAPING ELECTRICAL WINDINGS

Joseph S. King, Marysville, Ohio, assignor to King Industrial Products Co., Inc., Columbus, Ohio

Filed Jun. 21, 1982, Ser. No. 390,217
Int. Cl.³ B21D *11/02, 11/10*
U.S. Cl. 72—481 **9 Claims**



1. An adjustable bending form comprising:

(a) an elongated flexible sheet having one surface defining the form surface;

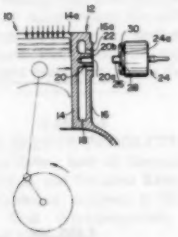
(b) spaced end supports mounted on a frame and attached near the ends of said sheet, said end supports being adjustably spaced for imparting a selected arch in said one surface, at least one of said end supports also being angularly adjustable relative to the other end support about a pivot axis disposed generally in the direction of a line extending between said spaced end supports for imparting a twist in said sheet and for supporting said sheet with the selected twist; and

(c) intermediate supports mounted on said frame for supporting said sheet intermediate its ends, said intermediate supports being angularly adjustable about a pivot axis disposed generally in the direction of a line extending between said end supports for supporting said sheet at said selected arch and said selected twist.

4,450,709
INTERNAL COMBUSTION ENGINE WITH ENGINE KNOCK SENSOR

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co. Ltd., Yokohama, Japan

Filed Oct. 28, 1982, Ser. No. 437,464
Claims priority, application Japan, Nov. 5, 1981, 56-165112[U]
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 9 Claims

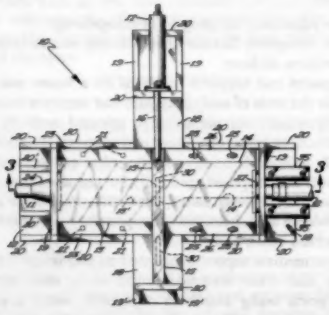


1. An internal combustion engine comprising:
a cylinder block having a cylinder wall section defining thereinside a cylinder bore, and an outer wall section located outside of said cylinder wall section, an engine coolant passage being formed between said cylinder wall and outer wall sections;
a boss section formed at and projecting from said cylinder wall section, said boss section being formed with a threaded portion;
means defining an opening at said cylinder block outer wall section, said opening being located at a position generally corresponding to said boss section to prevent said boss section from contacting said cylinder block outer wall section;
an engine knock sensor having a threaded portion which engages with the threaded portion of said boss section; and
a resilient seal member disposed between said engine knock sensor and said cylinder block outer wall section to prevent engine coolant from leaking through said cylinder block outer wall section opening.

4,450,710
DEVICE FOR TESTING HEART VALVE PROSTHESES

William S. Nettekoven, White Bear Lake, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 13, 1981, Ser. No. 310,467
Int. Cl.³ G01M 19/00
U.S. Cl. 73—37 18 Claims

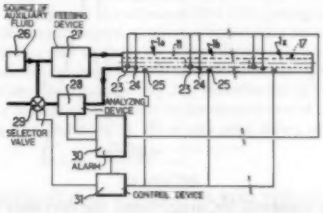


1. In a system for hydrodynamic, in vitro testing of heart valve prostheses of the type having a flow channel and means for including a flow of desired characteristics within said flow channel, said flow channel including test fixture means for supporting a prosthesis to be tested in a desired orientation within said flow, the improvement wherein said test fixture means comprises first and second chamber means spaced from each other along said flow channel and shuttle means intermediate said chamber means and movable between at least first and second positions, said shuttle means comprising means for supporting at least one heart valve prosthesis and selectively positioning said prosthesis in a desired orientation within said flow and without said flow by movement of said shuttle means between said first and second positions.

4,450,711
METHOD OF AND DEVICE FOR REMOTELY DETECTING LEAKS IN A FLUID-CONVEYING PIPE-LINE SUBMERGED WITHIN AN AMBIENT FLUID AND PIPE-LINE PROVIDED WITH SUCH A DETECTION DEVICE

Jean Claude, Rambouillet, France, assignor to Technigaz, France

Filed Nov. 18, 1981, Ser. No. 322,588
Claims priority, application France, Nov. 24, 1980, 80 24892
Int. Cl.³ G01M 3/28
U.S. Cl. 73—40.5 R 9 Claims



1. A method for detection and location of fluid leaks in a pipe-line in an ambient fluid and having a tube conveying a fluid, said tube having a wall, said method comprising the steps of
surrounding the tube with a confined layer of sweeping auxiliary fluid interposed between the tube and the ambient fluid, said auxiliary fluid being a mixture of gases at least the main component of which is an inert gas at a pressure lower than the respective pressures of the conveyed fluid and the ambient fluid and being constantly kept flowing throughout the length of the pipe-line;
guiding any leak of conveyed fluid generally in a circumferential direction along the wall of said tube to accumulate said fluid into an accumulation volume divided into adjacent drain sections extending along said tube and isolated in sealing relationship from each other;
transferring the accumulated fluid to the auxiliary fluid when the pressure of the accumulated fluid within a drain section reaches a predetermined value;
sensing the presence of said conveyed fluid within said auxiliary fluid by continuous monitoring of the composition of said auxiliary fluid at one accessible end of said pipe-line and at spaced locations along said pipe-line; and
emitting a signal indicative of the presence of said conveyed pipe in said auxiliary fluid as a result of said sensing.

4,450,712

PULP CONSISTANCY MEASUREMENT

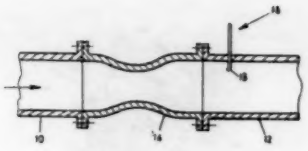
Kevin O'Shaughnessy, Widenham, South Africa, assignor to Brenda O'Shaughnessy, Widenham, South Africa

Filed Oct. 19, 1981, Ser. No. 313,068

Claims priority, application South Africa, Dec. 11, 1980, 80/7753

Int. Cl.³ G01N *15/04*

U.S. Cl. 73—61 R 6 Claims



1. A method of determining the concentration of particulate or fibrous material in a fluid comprising:

(a) a flowing of the fluid at a velocity to cause turbulence to the particulate or fibrous material in the fluid through a pressure reducing unit with high level of recovery of pressure drop downstream thereof;

(b) measuring the pressure upstream of the unit;

(c) measuring the recovery pressure downstream of the unit;

(d) comparing the above measurements with a constant to determine the concentration of the particulate or fibrous material.

4,450,713

METHOD FOR MEASURING HARDNESS OF RUBBER AND PLASTICS AND A HARDNESS TESTER FOR USE THEREIN

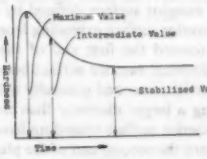
Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jun. 16, 1982, Ser. No. 389,156

Claims priority, application Japan, Jun. 24, 1981, 56-99436

Int. Cl.³ G01N *3/42*

U.S. Cl. 73—81 3 Claims



1. A method for measuring the hardness of a test material, such as rubber, plastics, etc. comprising the steps of:

detecting the amount of displacement of a feeler of a hardness tester,

converting the amount of displacement into electric digital signals,

evaluating the electric digital signals in terms of the hardness of the test material,

detecting the maximum value, the intermediate value, and the stabilized value of the hardness of the test material from the evaluated electric digital signals,

measuring the variation of hardness from the maximum value to the stabilized value after the lapse of a preset space of time, and

displaying the hardness data of the test material on a display unit.

4,450,714

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

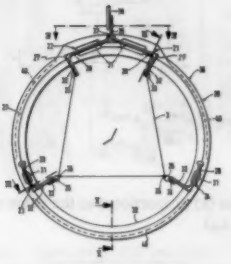
Werner Prohaska, Bietigheim-Bissingen, and Peter Romann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 356,987

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109608

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—118.1 6 Claims



1. An apparatus for measuring the mass of a flowing medium in a flow path, such as the aspirated air mass of an internal combustion engine, including a sensor ring encompassing a flow cross-section and at least one temperature-dependent resistor disposed in the flow path of the medium and embodied as a hot wire, the temperature and/or resistance of which is regulated in accordance with the flowing mass and an adjustment variable is a standard for the mass of the flowing medium, said hot wire being supported on said sensor ring in the form of a loop from one end to the other by at least three support points, said sensor ring is formed of plastic and has fastening slits formed therein extending in an axial direction with respect to the sensor ring with said fastening slits open toward at least one end face of the sensor ring, a radial slit leading from said axially directed slit to an inside diameter of the sensor ring, each said support point including a guide section which protrudes into the flow cross section through said radial slit and a fastening section secured in the fastening slit such that the fastening section of said support point is bent at an angle relative to the guide section of said support point.

4,450,715

METHOD FOR MEASURING THE FLOW OF A MEDIUM

Jaihind S. Sumal, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 415,611

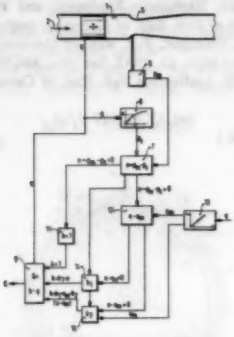
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203986

Int. Cl.³ G01F *1/00*; G01M *15/00*

U.S. Cl. 73—118.1 3 Claims

1. A method for measuring the flow of a medium, in particular of air aspirated by an internal combustion engine, in a flow cross section by means of a flow rate meter and for correcting the flow rate value furnished by the flow rate meter in the event of pulsating flow, comprising the steps of, measuring at a restriction of the flow cross section the pressure of the medium (p_m); forming the difference ($p_m - p_2$) between the pressure of the medium (p_m) and a pressure value (p_2) associated with the flow rate value (q) for steady flow in order to ascertain the pulsation amplitude ($a \sim p_m - p_2$); forming the amplitude difference ($a - a_m$) between the pulsation amplitude (a) and a pulsation amplitude value for reversed flow (a_m) associ-

ated with the flow rate value (q); and forming a corrected flow rate value (Q) by multiplying the flow rate value (q) with a



correction value (k) proportional to the value of the amplitude difference ($a - a_m$).

4,450,716

PROCESS AND DEVICE FOR MEASURING THE PRESSURE OF TIRES, PARTICULARLY FOR AIRCRAFT

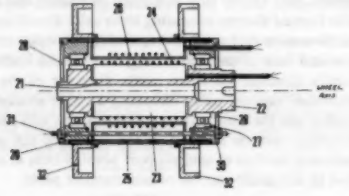
Jean-Louis J. R. Lefaucheux, Paris; Claude Martin, Plaisir, and Edmond E. A. Mokrani, Sceaux, all of France, assignors to Societe Anonyme de Telecommunications, France

Filed Jun. 17, 1981, Ser. No. 274,636

Claims priority, application France, Jun. 19, 1980, 80 13579

Int. Cl.³ B60C *23/00*; G08G *1/12*

U.S. Cl. 73—146.5 **3 Claims**



1. A device for measuring the pressure of a tyre of a wheel of an aircraft landing gear, comprising a high frequency transformer having a primary winding concentric with respect to and mechanically fast with the wheel and a secondary winding concentric with respect to said primary winding and mechanically fast with said landing gear; a passive sensor means operatively connected to said primary winding for linearly converting a variation in pressure in the tyre into an electrical information variation, in situ; means, including said transformer, for conveying the electrical information from said sensor to the cockpit of said aircraft, a self-oscillator having an input operatively connected to said secondary winding, the oscillation frequency of said self-oscillator being controlled by the value of said electrical information from said sensor; and means for converting the signal issuing from said self-oscillator into a D.C. voltage proportional to a frequency variation being proportional to said variation in pressure; the electrical information from said sensor, before transmission to said cockpit, being applied to said primary winding; the electrical information from said sensor being modified according to the square of the ratio n of transformation between the primary winding and the secondary windings.

4,450,717

DOWNHOLE SAMPLING APPARATUS

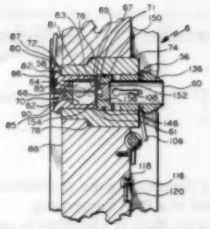
Bruce F. Wiley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 177,958, Aug. 14, 1980, Pat. No. 4,339,947.

This application May 12, 1982, Ser. No. 377,499

Int. Cl.³ E21B *49/04*

U.S. Cl. 73—151 **6 Claims**



1. Apparatus comprising:

(a) a plus having a first end and a second end and a longitudinal axis extending from the first end to the second end, said plug having a passage extending along its longitudinal axis from its first end to its second end defined by a first generally cylindrical inside surface extending from the first end of the plug, a second generally cylindrical inside surface defining a larger diameter than the first generally cylindrical inside surface extending from the second end of the plus toward the first end of the plug, a third generally cylindrical inside surface defining a diameter intermediate the diameter of the first generally cylindrical inside surface and the diameter of the second generally cylindrical inside surface between the first generally cylindrical inside surface and the second generally cylindrical inside surface, a generally frustoconical inside surface diverging from the first generally cylindrical inside surface to the third generally cylindrical inside surface, and an annular shoulder between the third generally cylindrical inside surface and the second generally cylindrical inside surface, and an exterior surface defined by a first generally cylindrical exterior surface extending from the second end of the plug toward the first end of the plug, said first generally cylindrical exterior surface being provided with a threaded portion, a second generally cylindrical exterior surface having a larger diameter than the first generally cylindrical exterior surface extending from the first end of the plug toward the second end of the plug, a third generally cylindrical exterior surface having a diameter intermediate the diameter of the first generally cylindrical surface and the second generally cylindrical surface between the first generally cylindrical surface and the second generally cylindrical surface, a first exterior annular shoulder intermediate the first generally cylindrical surface and the third generally cylindrical surface, and a second exterior annular shoulder intermediate the third generally cylindrical surface and the second generally cylindrical surface;

(b) a first electrode positioned along the longitudinal axis of the passage from the first end partially to the second end;

(c) a second electrode parallel to the first electrode extending from the frustoconical inside surface partially to the second end; and

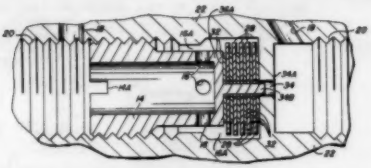
(d) a third electrode extending between the first electrode and the second electrode.

4,450,718

FLOW METER INCLUDING IMPROVED LAMINAR FLOW RESTRICTOR DEVICE THEREFOR

Gerrit A. Hartemink, Harderwijk, Netherlands, assignor to Advanced Semiconductor Materials N.V., Bilthoven, Netherlands

Filed Apr. 19, 1982, Ser. No. 369,660
Int. Cl.³ G01F 5/00
U.S. Cl. 73—202 10 Claims



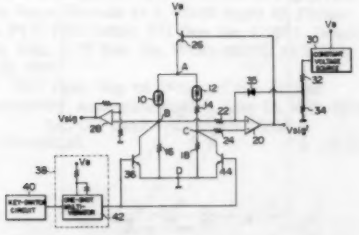
1. In a flow meter, a flow restrictor assembly comprising, in combination, inlet means for introducing a fluid located within said flow meter with an input portion of said flow restrictor; flow restrictor means coupled to said inlet means for creating laminar fluid flow, said flow restrictor means comprising a first plurality of washers each having a center aperture, and a second plurality of discs each having a center aperture and a plurality of radially extending slots passing through the front and rear surfaces of each disc and in communication with said center aperture, each one of said second plurality of discs being located between a pair of said first plurality of washers, the center apertures of said first plurality of washers being lined up with the center apertures of said second plurality of discs; and outlet means for permitting the laminar fluid to flow out an output portion of said flow restrictor, said outlet means comprising all the center apertures of said first plurality of washers and said second plurality of discs and said plurality of radially extending slots in communication with said center apertures of said second plurality of discs.

4,450,719

AIR FLOW METER

Yutaka Nishimura; Yoshishige Ohyama, and Noboru Sugiura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 434,059
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 10 Claims



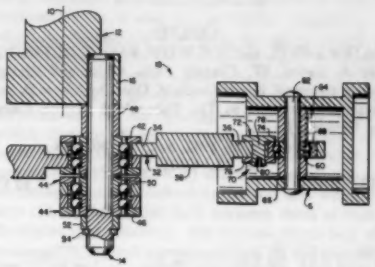
1. An air flow meter including a first resistor whose resistance varies with temperature, a second resistor connected in series with said first resistor, and control means for controlling a current flowing through said first resistor so that said first resistor has a predetermined temperature, to measure the flow rate of air by said current flowing through said first resistor, said air flow meter comprising means for forming a short circuit between both ends of said second resistor for a predetermined time, when said air flow meter is energized.

4,450,720

FLOWMETER CONNECTING ROD ASSEMBLY

John K. Max, 1420 Healdsburg Ave., Healdsburg, Calif. 95448

Filed Aug. 23, 1982, Ser. No. 410,204
Int. Cl.³ G01F 3/18
U.S. Cl. 73—247 9 Claims



1. A flowmeter connecting rod assembly for use with a radial piston flowmeter of the type including a plurality of cylinders and pistons arranged radially about a crank axis and an eccentric axial crank pin, a wrist pin mounted within the piston along an axis generally parallel to the crank axis, the pistons each having the connecting rod assembly comprising:

a connecting rod having a crank end and a piston end;

a wrist pin ball bearing having inner and outer races and mounted about the wrist pin;

a crank pin bearing mounted about the crank pin ;

said crank and piston ends of said rod having means for mounting said crank pin and wrist pin ball bearings thereto;

means for axially spacing said wrist pin ball bearing along said wrist pin; and

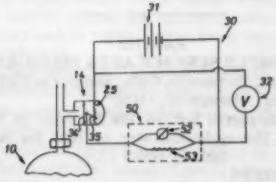
means for securing said wrist pin ball bearing to said rod.

4,450,721

APPARATUS FOR INDICATING QUANTITY OF LIQUIFIED GAS CONTAINED IN A STORAGE CONTAINER

John Gaunt, and Kenneth E. Gregory, both of Nottingham, England, assignors to Energy Innovation Enterprises, Ltd., Channel Islands

PCT No. PCT/GB81/00072, 371 Date Dec. 17, 1981, 102(e) Date Dec. 17, 1981, PCT Pub. No. WO81/03067, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 16, 1981, Ser. No. 333,874
Claims priority, application United Kingdom, Apr. 17, 1980, 8012608
Int. Cl.³ G01F 23/18, 23/14
U.S. Cl. 73—290 B 10 Claims



1. Apparatus for indicating quantity of liquified gas contained in a storage container for supplying gas to a consuming appliance during the supplying of gas to said appliance, the apparatus including a pressure sensing means for sensing gas

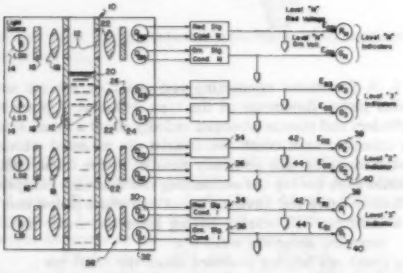
pressure within the container and being arranged to operate an indicator means which give a desired indication, the indicator means being calibrated to indicate the quantity of liquified gas contained in said container, the indicator means being calibrated to indicate readings up to at least the plateau zone of an earlier determined pressure versus weight curve of the dynamic liquified gas/gas system within the container during use.

4,450,722

WATER LEVEL GAUGE WITH FAULT DETECTOR

Marion A. Keyes, IV, Chagrin Falls, Ohio, and Richard A. Salmen, deceased, late of Canfield, Ohio (by Marie P. Salmen, executrix), assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 26, 1982, Ser. No. 402,188
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—293 **10 Claims**



1. A liquid level gauge comprising:

a liquid column for containing a level of liquid;

light means on one side of said column for obliquely shining light having at least a first and a second color through the column, the light of the first color passing through the column relatively readily above a level of liquid therein and light of the second color passing through the column relatively readily below the level of the liquid therein;

at least one detector assembly on an opposite side of said column for receiving light from said light means, said detector assembly comprising a first detector for generating a first signal when light of said first color shines on said detector assembly and a second detector for generating a second signal when light of said second color shines on said detector assembly; and

a detector circuit connected to said at least one detector assembly for indicating which of said first and second detectors is producing a signal including a fault detector assembly connected to said first and second detectors for indicating a fault when any condition arises other than a condition where a single signal is received from a single one of said first and second detectors.

4,450,723

MULTI-SAMPLE SURFACE AREA MEASUREMENT

Richard L. Scott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 128,981, Mar. 10, 1980, Pat. No. 4,335,610. This application Mar. 16, 1982, Ser. No. 358,743
Int. Cl.³ G01N *15/02*
U.S. Cl. 73—432 PS **7 Claims**

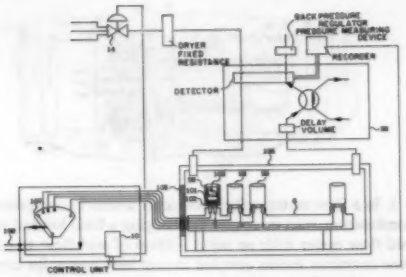
1. An apparatus for measuring the amount of a fluid adsorbed by each of a plurality of samples comprising

(a) an adsorption and desorption zone provided with means for exposing the plurality of samples to said fluid,

(b) a detector operatively connected to said adsorption and desorption zone and capable of detecting the fluid released from said sample and generating a signal representative of the quantity of said released fluid,

(c) a plurality of sample holding means within said adsorption and desorption zone,

(d) a plurality of individually controllable heating elements, each one sample holding means being associated with one of said heating elements such as to permit individual heating of each sample arranged in the respective sample



holding means independently of the heating of all the other samples,

(e) housing means enclosing said adsorption and desorption zone and separating said adsorption and desorption zone from uncontrolled contact with the surrounding atmosphere,

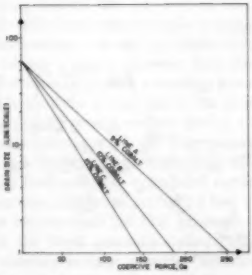
(f) control means for activating each individual heating element in order to heat the sample associated with this heating element and to desorb said fluid from said sample.

4,450,724

METHOD FOR DETERMINING THE SIZE OF METAL CARBIDE GRAINS IN CEMENTED CARBIDES

Richard F. Cheney, 50 Hemlock Rd.; Anil Bansal, 26 Larch Rd., and Edward R. Kimmel, 153 Center St., all of Sayre, Pa. 18840

Filed Oct. 14, 1982, Ser. No. 434,437
Int. Cl.³ G01N *15/00, 27/72*
U.S. Cl. 73—432 R **6 Claims**



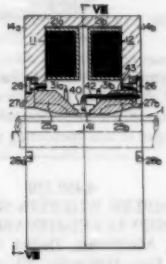
1. A method of determining the size of grains of refractory metal carbide in a cemented metal carbide comprising determining the composition and quantity of the metal binder material, determining the coercive force of the cemented metal carbide, obtaining a determination of metal carbide grain size based on coercive force being a function of grain size for said determined composition of metal binder and said determined quantity of metal binder.

4,450,725

ELECTROMAGNETIC-ACOUSTIC MEASURING APPARATUS

Hisao Yamaguchi; Kazuo Fujisawa, both of Amagasaki; Takashi Kadowaki, Hitachi; Susumu Itoh, Hitachi; Soji Sasaki, Hitachi, and Ichiya Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Sumitomo Metal Industries, Ltd., both of Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,445
Claims priority, application Japan, Jun. 10, 1981, 56-88188; Jun. 10, 1981, 56-88189; Apr. 14, 1982, 57-61126
Int. Cl.³ G01N *29/00, 29/04*
U.S. Cl. 73—643 15 Claims



1. An electromagnetic-acoustic measuring apparatus comprising:

an exciting coil having an opening hole into which a body to be inspected is to be inserted, said exciting coil being applied with a d.c. voltage to generate a magnetic field in a direction substantially parallel to a surface of said body;

a transmitting coil for generating mechanical strain in a surface portion of said body, said surface portion being subjected to the action of the magnetic field produced by said exciting coil;

a receiving coil for detecting said mechanical strain at a surface of said body after said mechanical strain has been propagated in said body;

a core enclosing surfaces of said exciting coil except a surface facing said body;

pole pieces supported by said core for supporting at least one of said transmitting and receiving coils; and

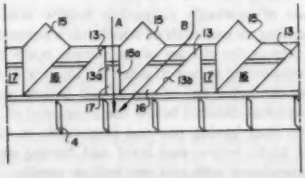
each of inner and outer surfaces of said pole pieces being tapered so as to concentrate said magnetic field at the portion of said body.

4,450,726

FLOW-OPERATED MEASURING APPARATUS

Seppanen Seppo, Itaranta 13 E, 02100 Espoo 10, Finland

PCT No. PCT/FI81/00034, 371 Date Jan. 6, 1982, 102(e) Date Jan. 6, 1982, PCT Pub. No. WO81/03378, PCT Pub. Date Nov. 26, 1981
PCT Filed May 18, 1981, Ser. No. 342,000
Claims priority, application Finland, May 16, 1980, 801589
Int. Cl.³ G01F *1/82;* G01N *17/06*
U.S. Cl. 73—861.35 10 Claims



1. A measuring apparatus for measuring a parameter of a flowing liquid, gas or other such medium, said apparatus comprising:

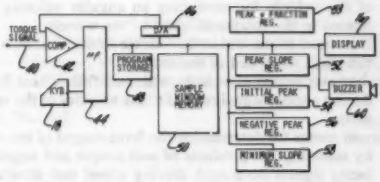
a flow pipe (1); a rotor (2) fitted coaxially in said pipe for rotation; a remeter (10,11) connected to said rotor for measuring rotation thereof; a flow guide member (5) located upstream of said rotor in the principle flowing direction for varying a flow amount directed at an angle to said rotor to vary a rotational speed of said rotor; an actuator located upstream of said flow guide member which actuator is connected to said flow guide member; and a sensing element (7) for sensing the parameter, disposed in said actuator; characterized in that said guide member (5) consists of a director (8) and a controller (9) which are installed in succession within the flow pipe (1) in the flowing direction and which are interrotatable in a plane perpendicular to the principle flowing direction and which director (8) and controller (9) comprises support members (12,14;18,20;25,27) and at least two bladelike members (13,15;19,21;24,26) which are engaged in one of succession and an interlocking fashion and which members (13,15;19,21;24,26) form between them at least two divergent flow channels, the mutual proportion of the crosssection thereof being dependent on the mutual rotation of the director (8) and the controller (9) which rotation takes place according to a measurement from said sensing element (7) which acts upon said actuator to cause rotation of one of said director and controller and which varies said flow amount.

4,450,727

DIGITAL RETORQUE MEASURING APPARATUS

James H. Reinholm, Livonia, and Eugene J. Marcinkiewicz, Plymouth, both of Mich., assignors to GSE, Inc., Farmington Hills, Mich.

Filed Apr. 29, 1982, Ser. No. 372,878
Int. Cl.³ B25B *23/142*
U.S. Cl. 73—862.23 10 Claims



1. In a method of detecting breakaway or valley torque levels associated with the amount of previously applied torque to a fastener wherein torque is subsequently applied to the fastener in the tightening direction until further motion of the fastener is obtained, and wherein an analog signal is generated as a function of the subsequently applied torque, the improvement comprising:

(a) defining a window of digital sample values in a memory by using a microprocessor to sample the analog signal and generate digital sample values therefrom until an analysis of said samples indicate that samples corresponding to the breakaway and/or valley torque levels have been stored in memory; and

(b) thereafter, using said microprocessor to examine the characteristics of the samples within the window to search for those samples corresponding to the breakaway and/or valley torque levels.

10. In an apparatus for detecting breakaway or valley torque levels associated with the amount of previously applied torque to a fastener wherein torque is subsequently applied to the fastener in the tightening direction until further motion of the fastener is obtained, and wherein an analog signal is generated as a function of the subsequently applied torque, wherein the improvement comprises:

means for sampling the analog signal and generating digital sample values;

means for storing said samples in a digital memory until an analysis of said samples indicates that samples corresponding to the breakaway and/or valley torque levels have been generated and stored in memory; and

means for examining the characteristics of the samples in the memory to search for samples corresponding to the breakaway and/or valley torque levels.

4,450,728

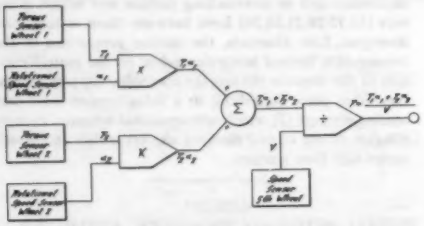
VEHICLE FORCE MEASUREMENT SYSTEM

Severino D'Angelo, Laguna Beach, and Max J. Moore, Walnut, both of Calif., assignors to Horiba Instruments Incorporated, Irvine, Calif.

Filed Oct. 6, 1981, Ser. No. 309,108

Int. Cl.³ G01L *5/13*

U.S. Cl. 73—862.28 **4 Claims**



1. A vehicle force measurement system for measuring the force output of a vehicle while the vehicle is operating on a roadway, including:

torque sensor means connected to each of the driving wheels of the vehicle for producing a torque signal related to the rotational torque applied to the wheels;

speed sensor means connected to each of the driving wheels of the vehicle for producing an angular velocity signal related to the rotational speed of the wheels;

a fifth wheel connected to the vehicle so that said fifth wheel rotates at the speed of the vehicle;

tachometer means associated with said fifth wheel for producing a speed signal related to the velocity of the vehicle; and

circuit means for determining the force output of the vehicle by summing the products of said torque and angular velocity signals from each driving wheel and dividing the result by said speed signal.

4,450,729

DEVICE FOR MEASURING AND MONITORING THE DRIVE OF AN AGRICULTURAL IMPLEMENT

Christoph Troeder; Manfred Faber, both of Aachen, and Peter Seigert, Lohmar, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,834

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112714

Int. Cl.³ G01L *3/10*

U.S. Cl. 73—862.34 **6 Claims**

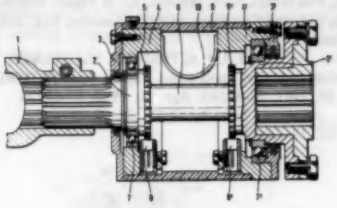
1. A device for measuring torque in a drive shaft particularly in the drive line between the power take off shaft of a tractor and an agricultural implement comprising:

a torsion-loaded measuring shaft;

a pair of toothed wheels rotatively fixed, respectively, at opposite ends of said shaft;

connecting journals adjacent each of said toothed wheels axially outwardly thereof, said connecting journals being dimensioned with a diameter which is approximately twice the diameter of said measuring shaft;

a housing including a pair of bearing support means each having bearings for rotatably supporting said connecting journals, a resilient tubular member extending between said bearing support means and bendable bracket means connecting said bearing support means together in rotatively fixed engagement; and



sensor means supported on said bearing support means in contact-free operative association with said toothed wheels to sense phase displacement therebetween proportional to torque in said measuring shaft.

4,450,730

LIQUID SAMPLER WHEREIN SOLUTION TO BE SAMPLED IS USED AS RETRIEVABLE SAMPLER WASH

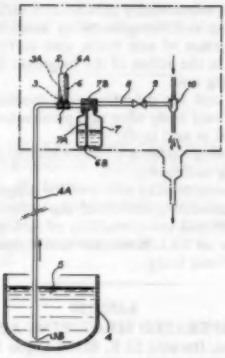
Christian Levos, Martinvast; Daniel Perie, Cherbourg, and Jean-Francois Gex, Haineville, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 2, 1982, Ser. No. 365,004

Claims priority, application France, Apr. 8, 1981, 81 07064

Int. Cl.³ G01N *1/12, 1/14*

U.S. Cl. 73—864.61 **3 Claims**



1. Apparatus whereby a sample can be drawn from a body of liquid that is maintained substantially at a predetermined level into a sample bottle that has at one end thereof a resilient pierceable sealing closure, said apparatus comprising:

A. supporting means for receiving and holding the sample bottle with its said end lowermost and at an elevation substantially above said level;

B. a pair of upwardly projecting hollow needles on said supporting means, each of which has a pointed upper end that pierces the closure of the sample bottle received on said supporting means to enter the interior of that sample bottle, the upper end of one of said hollow needles being a substantial distance below the upper end of the other;

C. a first duct having one end immersible in said body of liquid to be below said level and having its other end communicated with said one hollow needle;

D. a sealed wash bottle having a bottom end below said elevation but substantially above said level;

E. a second duct having one end opening to the interior of

said wash bottle near an upper end thereof and having its other end connectable with a suction source; and

F. a third duct having one end communicated with said other hollow needle and having its other end opening to the interior of the wash bottle near the bottom end thereof, so that upon connection of said second duct with said suction source a substantial quantity of liquid from said body is drawn into the wash bottle through the first duct and the sample bottle on said supporting means, to ensure that liquid retained in the sample bottle is representative of liquid in said body.

4,450,731

TRAVERSING UNIT WITH BALANCED LOAD APPLYING MEANS

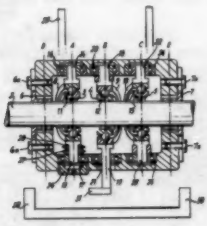
George Wardley, Stockport, England, assignor to Maridon (Engineering Specialties) Limited, Denton, England

Filed May 11, 1981, Ser. No. 262,432

Claims priority, application United Kingdom, May 9, 1980, 8015518

Int. Cl.³ F16H *21/16*

U.S. Cl. 74—25 **11 Claims**



1. A traversing unit comprising:

a housing,

a shaft rotatably mounted in the housing,

a plurality of rings within said housing and surrounding and in contact with the shaft,

means for applying a balanced load to the shaft through the rings in planes at right angles to the axis of the shaft, said balanced load applying means including unitary loading means for urging at least one of the rings directly against the shaft and for urging another ring against the shaft in the opposite direction from said one ring, and

means for mounting the rings in the housing so as to prevent relative movement between the rings and housing in the axial direction of the shaft, but allow relative movement of the rings and housing in a direction at right angles to the axis of the shaft, said means including mounting means slidably disposed in said unitary loading means and which connect said unitary loading to the housing.

4,450,732

DEVICE FOR IMPOSING THE LINEAR AND ANGULAR MOVEMENT TO THE VALVE STEM

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Aug. 31, 1982, Ser. No. 417,484

Int. Cl.³ G05G *7/00*

U.S. Cl. 74—107 **1 Claim**

1. The device for imposing the linear and angular movement to the rotatable elongated member comprising in combination:

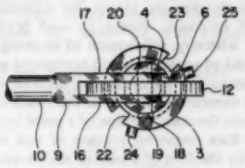
(a) a stationary housing rotatably supporting said rotatable elongated member;

(b) a slitted-opening disposed at one extremity of said rotatable elongated member wherein the center plane of said slitted-opening is substantially parallel to the axis of the rotation of said rotatable elongated member which axis of rotation coincides with the central axis of said rotatable elongated member;

(c) a yoke having a window slidably engaging said slitted-opening, said yoke rotatably secured to said stationary housing;

(d) a cam roller rotatably disposed in said slitted-opening and rotatably confined in said window included in said yoke, said cam roller eccentrically engaged by a pin disposed across said slitted-opening and anchored by said rotatable elongated member at said one extremity; and

(e) a handle rigidly connected to said cam roller, said handle pivotable about the axis of said pin and further pivotable about the axis of rotation of said rotatable elongated member; whereby, a pivoting movement of said handle about



the axis of said pin in one direction imposes a linear movement to said rotatable elongated member in the first direction parallel to the axis of rotation of said rotatable elongated member and another pivoting movement of said handle about the axis of said pin in the other direction imposes another linear movement to said rotatable elongated member in the second direction opposite to said first direction; and the pivoting movements of said handle about the axis of rotation of said elongated member imposes the rotating movements on said rotatable elongated member about the axis of rotation of said rotatable elongated member.

4,450,733

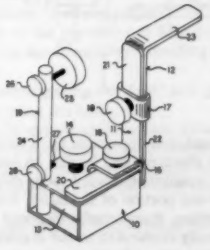
PEDAL EXTENSION DEVICE

Larry A. Rantapaa, 1398 Grantham St., St. Paul, Minn. 55108

Filed Oct. 5, 1981, Ser. No. 308,264

Int. Cl.³ G05G *1/16*

U.S. Cl. 74—562 **15 Claims**



1. An adjustable pedal extension device for the demountable attachment to a foot pedal of a machine, said device comprising:

a. a body frame having an open end for receiving a pedal thereinto, said body frame further having an adjustable clamping member for securing said body frame to a pedal, said body frame additionally having pedal adjustment means extending generally upwardly therefrom for contact with a portion of the machine, said pedal adjustment means comprising a generally vertical member extending upward and attached to said body frame, and having at least one horizontally adjustable abutment member extending from said vertical member, said adjustable abutment member being a threaded shaft portion having a

knob for turning at one end and having a padded member at the opposite end for abutment against a portion of the machine, said vertical member further having a threaded aperture therethrough for adjustably receiving said threaded shaft of said adjustable abutment member,

b. horizontal extension means for extending at least a generally horizontal distance from said body frame,

c. first securement means for adjustably holding said horizontal extension means to said body frame,

d. vertical extension means for extending generally in the vertical direction relative to said body frame, said vertical extension means having a foot receiving portion extending therefrom,

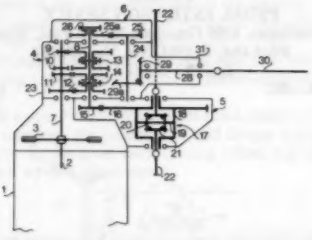
e. second securement means for adjustably holding said vertical extension means to said horizontal extension means, whereby, subsequent to securing said body frame to a pedal of a machine, said horizontal and vertical extension means are adjusted and secured by said first and second securement means to the reach of a user's foot to effectuate the manipulation of a pedal by the manipulation at said foot receiving portion of said vertical extension means by the foot of a user of said device, and, whereby, said pedal adjustment means is adjustably abutted against a portion of a machine to depress a pedal until the pedal becomes functionable, and to thereby remove any inoperative distance from the pedal.

4,450,734

TRANSMISSION APPARATUS FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Sadao Makishima, Akigawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,707
Claims priority, application Japan, Oct. 9, 1980, 55-142259
Int. Cl.³ F16H *37/06, 37/08*
U.S. Cl. 74—665 F **14 Claims**



1. A transmission apparatus, for a motor vehicle defining a longitudinal direction and having an internal combustion engine with a crankshaft transversely disposed in said vehicle adjacent an end portion of the latter, comprising

a transmission transversely disposed in said vehicle and operatively connected to the crankshaft of said engine at one end portion of said transmission,

said transmission having an output shaft and an output gear mounted on said output shaft at a position thereof adjacent to an end of said engine,

a final reduction gear engages with said output gear of said transmission,

a differential is secured to a side of said final reduction gear,

axles, adapted for a pair of wheels of the vehicle, are connected to the differential,

a transfer device provided at another end portion of said transmission, said transfer device comprising, a gear train provided at said another end portion of said transmission, and a clutch means for operatively engaging said gear train with said output shaft of said transmission, and

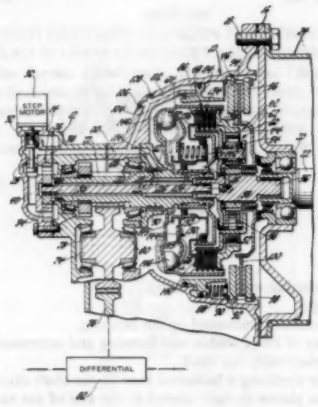
a propeller shaft means operatively connected to said gear train of said transfer device for driving other axles adapted for another pair of wheels of the vehicle and four-wheel drive.

4,450,735

PLANETARY TRANSMISSION WITH A SPRING APPLIED CENTRIFUGALLY SENSITIVE CLUTCH

Erkki A. Koivunen, Livonia, and James F. Sherman, Brighton both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 26, 1982, Ser. No. 352,953
Int. Cl.³ F16H *3/74, 57/10*
U.S. Cl. 74—781 R **3 Claims**



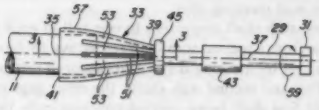
1. A transmission comprising; an input shaft; an output shaft coaxially aligned with the input shaft; housing means for rotatably supporting said input and output shafts; planetary gears means including a first member drivingly connected with said input shaft; a second member drivingly connected with said output shaft and a third member; fluid operated brake means disposed in said housing and being operatively connected with said third member of said planetary gear means and including a fluid pressure operated piston which is operable when pressurized to engage said brake means for establishing a reduction drive ratio in said planetary gear means; clutch means selectively operable for drivingly connecting said input shaft to said output shaft and including a fluid pressure operated means operable when pressurized to disengage said clutch means, spring engagement means for urging said pressure operated means toward engagement of said clutch means and centrifugal control means operatively connected for rotation with said output shaft for generating a force in said spring engagement means when the rotary speed of the output shaft is greater than a predetermined value; and fluidpressure source means drivingly connected with said input shaft for selectively pressurizing said brake means into engagement and said clutch means out of engagement including selectively operable control means for controlling the pressure level of said fluid pressure source means whereby said brake means can be disengaged and said clutch means will be spring loaded into engagement if the rotary speed of said output shaft is above said predetermined speed.

4,450,736

IMPACT-ACTUATED GRIPPING TOOL

Robert J. Kopnicky, Valparaiso, Ind., assignor to Bethlehem Steel Corp., Bethlehem, Pa.

Filed May 10, 1982, Ser. No. 376,874
Int. Cl.³ B25B 19/00
U.S. Cl. 81—463 2 Claims



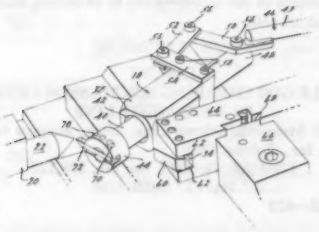
1. An impact-actuated gripping tool comprising:
(a) an elongated bar member having a bolt means at one end;
(b) a hollow, frustoconical gripping head having a proximal end fastened to the other end of said bar member and a distal end forming an opening for receiving a work piece to be unscrewed;
(c) hammer means slidably mounted on said bar member for movement between said bolt means and said gripping head;
(d) said gripping head further comprising:
(i) a first sidewall portion adjacent said proximal end, said first sidewall portion having an inner surface converging inwardly in the direction of said elongated bar member, said first sidewall portion including a plurality of longitudinally extending slots through the thickness of said first sidewall portion, dividing said first sidewall portion into a plurality of separate, individual segments, each of said segments being radially expandable and torsionally deformable, and
(ii) a second sidewall portion adjacent said distal end, said second sidewall portion being rigid.

4,450,737

LATHE TOOL

Dale Hitt, 20850 Westhaven, Southfield, Mich. 48075

Filed Jan. 30, 1981, Ser. No. 230,262
Int. Cl.³ B23B 5/38, 21/00
U.S. Cl. 82—24 R 9 Claims



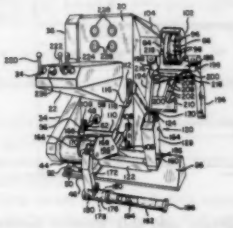
1. A lathe tool for use on a lathe having a generally horizontal bed, clamping means mounted on said horizontal bed and having a pair of spaced-apart clamping surfaces, and means for supporting a workpiece above the bed for rotation about an axis generally parallel to the bed, said lathe tool comprising:
mounting means including a longitudinally-extending body portion and an L-shaped mounting member having a longitudinal portion secured to said body portion of said lathe tool and a transverse portion extending away from both said body portion and said longitudinal portion and extending generally toward said clamping means, said longitudinal portion and said transverse portion each having two spaced-apart generally parallel surfaces adapted for engagement between said clamping means, said parallel surfaces on each of said longitudinal and transverse portions further being adapted to be engaged by said clamping means at varying locations on said parallel surfaces in order to allow adjustment of the angular orientation of the mounting member relative to said clamping means and relative to said workpieces; and
tool holding means connected to said body portion for reciprocable movement relative thereto, and means for reciprocably moving said tool holding means relative to said body portion toward and away from the workpiece.

4,450,738

TIRE SPLITTING APPARATUS

Myron D. Tupper, 37900 Sandy Heights, Sandy, Oreg. 97055, and Richard Bauer, Jr., 34689 SE. Fall Creek, Estacada, Oreg. 97023

Filed Sep. 8, 1981, Ser. No. 300,031
Int. Cl.³ B23B 5/14; B29H 21/08
U.S. Cl. 82—82 6 Claims



1. A tire splitting apparatus for splitting tire casings circumferentially into segments, comprising:
(a) a frame
(b) a powered drive roll mounted rotatably on the frame and engageable with the outer crown of a tire to rotate the tire;
(c) a tire lift arm pivoted on the frame and means for pivoting the arm;
(d) a pressure roll head mounted on the tire lift arm and including a pressure roll insertable into the tire casing and bearing on the inner crown of the casing adjacent the drive roll for pressing the casing against the drive roll;
(e) a knife mounted on the pressure roll head for reciprocation relative thereto for retractably extending through the crown of the tire;
(f) power means interengaging the knife and pressure roll head for reciprocating the knife;
(g) a pair of laterally spaced guide means mounted on the frame for lateral movement of each toward and away from the other for releasable contact with both side wall of a tire for centering various size tires relative to the knife; and
(h) power means engaging the guide means for moving the latter.

4,450,739

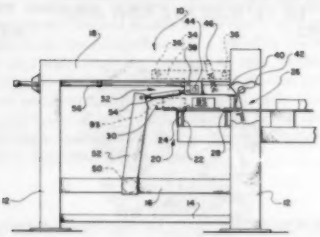
METHOD AND APPARATUS FOR TRANSFERRING SLUGS FROM A CONVEYOR TO A SLUG CUTTING DEVICE

John G. Buckner, Ramseur; Cletus E. Lineberry, Staley, and Jimmy W. Harris, Siler City, all of N.C., assignors to Auto-Systems & Service, Inc., Staley, N.C.

Filed Aug. 13, 1981, Ser. No. 292,686
Int. Cl.³ B28B 11/14; B26D 7/06
U.S. Cl. 83—23 5 Claims

1. A brick handling system for simultaneously transferring at least two brick slugs at a time from a conveying system towards a slug cutting device where the slugs are cut into

individual bricks as they are conveyed therethrough; said brick handling system comprising: conveying means for receiving slugs and transferring them in sequence to a discharge point thereon; a brick slug cutting device disposed adjacent one side of said conveying means in the vicinity of said discharge point and appropriately aligned with said conveying means and discharge point for receiving slugs moved from said discharge point and cutting the same into individual bricks; slug support means disposed adjacent said conveying means on a side opposite said slug cutting device and normally assuming a transfer position where said slug support means is generally horizontally aligned with said conveying means such that slugs can be conveniently horizontally moved between said conveying means and said support means; and slug transfer means disposed adjacent said conveying means in the vicinity of said discharge point for simultaneously conveying two consecutively arriving and horizontally aligned slugs towards said



brick cutting device, said slug transfer means including first engaging means for engaging a first slug on said conveying means at said discharge point and conveying said slug onto said support means after which said conveying means conveys a second consecutive slug to said discharge point; said transfer means including second engaging means for simultaneously conveying said first and second consecutive slugs, one after another in single tier fashion, directly across and over said conveying means towards said slug cutting device; said second engaging means including means for engaging said first slug on said support means while said support means is disposed in said transfer position and generally horizontally aligned with said conveying means for conveying said first slug from said support means towards said conveying means and said second consecutive slug and into engagement with said second consecutive slug for conveying said first and second consecutive slugs simultaneously directly over said conveying means towards said slug cutting device.

4,450,740

ROTARY ENVELOPE CUTTING APPARATUS

William A. Chapman, Jr., Hubbardston, and John J. Crowley, Ware, both of Mass., assignors to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 198,464, Oct. 20, 1980, abandoned. This application Feb. 18, 1983, Ser. No. 468,033

Int. Cl.³ B26D *1/56*

U.S. Cl. 83—303 **9 Claims**

1. A sheet material converting machine having rotary cutting means for shaping product blanks of such material comprising:

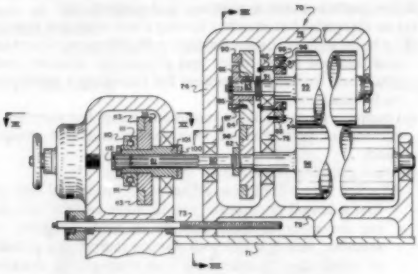
A. A series plurality of rotary cutting roll sets, each set mounted in respectively independent frame means collectively supported by primary machine frame means;

B. Transverse displacement means between each said independent frame means and said primary machine frame means for transversely adjusting the cutting position of each roll set relative to a longitudinal movement direction of product blanks through said converting machine;

C. Primary drive line means to synchronously drive two adjustable cutting roll sets as a cooperative pair for sequentially making transversely opposite and longitudinally aligned side cuts in a particular product blank progressing through said converting machine;

D. One roll of each cutting roll set having female cutting die means secured thereto and corresponding male cutting die means secured to the other roll of a respective set, said male and female dies meshing together rotatively with a lapped fit of respective shear cutting edges for cutting a section of product blank therefrom when positioned between said meshing dies;

E. A first stub shaft respective to one roll of each set being driven from a second stub shaft respective to the other roll of said set by meshing drive gears secured respectively to said first and second stub shafts, the drive gear respective to said first shaft being carried concentrically thereon by a flanged hub that is nonrotatively secured to said first



stub shaft, the flange of said hub including means to adjust and secure the angular position of said first shaft drive gear relative to said first shaft for angular adjustment of the meshing lap fit of cutting dies secured to said set rolls; and

F. Bearing means for anti-frictionally supporting one axial end of said one roll of said set, said bearing means being radially and axially secured about said first stub shaft and radially and axially secured within an adjustment sleeve means, said adjustment sleeve means being threadably received by respective independent frame means whereby thread advancement of said sleeve means axially translates said one roll of said set relative to said other roll for axial adjustment of the meashing lap fit of cutting dies secured to said set rolls.

4,450,741

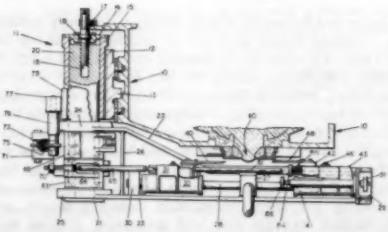
MULTIPLE GOB SHEARING MECHANISM OPERATING IN A STRAIGHT LINE

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 14, 1982, Ser. No. 398,122

Int. Cl.³ C03B *5/38*

U.S. Cl. 83—623 **8 Claims**



1. Apparatus for shearing multiple streams of molten glass

into gobs comprising a feeder bowl having a plurality of in-line openings extending through the bottom thereof through which molten glass issues, a vertical post, means mounting said post to the side of the feeder bowl, a carriage cantilevered from the lower portion of said post, said carriage extending normal to the line of said openings, at one side thereof, a first pair of horizontally spaced axially aligned shafts carried by said carriage, a second, horizontally spaced, shaft extending parallel to said first pair of shafts, a pair of opposed slides mounted to move on said first and second shafts, drive sleeve means mounted for rotation about the axis of said post, a first drive link connected between one side of said drive sleeve and one slide, a second drive link connected between the opposite end of said drive sleeve and the other slide, means connected to said drive sleeve for biasing said sleeve in a clockwise direction, means connected to drive sleeve for oscillating said sleeve about the axis of the post, and means for mounting shear blades on said slides for relative movement to shear the streams of molten glass.

4,450,742

ELECTRONIC MUSICAL INSTRUMENTS HAVING AUTOMATIC ENSEMBLE FUNCTION BASED ON SCALE MODE

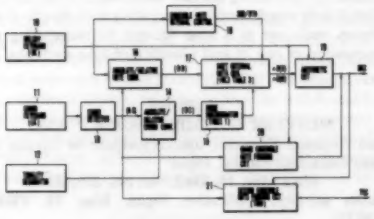
Toshio Sugiura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,306

Claims priority, application Japan, Dec. 22, 1980, 55-180474; Dec. 26, 1980, 55-183689; Dec. 26, 1980, 55-183690; Dec. 26, 1980, 55-183691

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **21 Claims**



1. An electronic musical instrument having an automatic ensemble note function based on a scale mode, comprising

(a) a keyboard for performing a melody;

(b) chord performing means for performing accompaniment chords;

(c) tonality designating means for designating a tonality of a music to be performed;

(d) scale mode judging means for judging the scale mode of the music being played based on the designated tonality and the accompaniment chord;

(e) ensemble note data forming means for forming ensemble note data determined in accordance with the judged scale mode and depressed melody keys of said keyboard; and

(f) musical tone forming means for forming musical tones corresponding to said ensemble note data and musical tones corresponding to said melody keys.

4,450,743

ELECTRONIC MUSICAL INSTRUMENT WITH MUSICAL INFORMATION INPUT MEANS

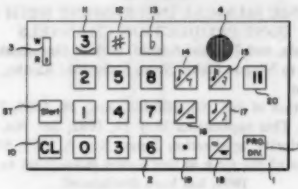
Akira Tanimoto, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 154,371, May 29, 1980, which is a continuation of Ser. No. 881,437, Feb. 27, 1978, abandoned. This application Apr. 9, 1982, Ser. No. 367,053

Claims priority, application Japan, Feb. 28, 1977, 52-22087; Dec. 26, 1977, 52-157815

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.03 **5 Claims**



1. An electronic musical instrument and calculator comprising:

calculator means for performing calculations when said instrument is in a calculation mode;

means for selecting between a musical instrument mode and the calculator mode;

input key switch means for introducing numerical information when in the calculator mode and pitch information and duration information when in a musical instrument mode, said pitch information being introduced by digit keys also used to introduce the numerical information when in said calculator mode, the numbers produced by said digit keys corresponding to the pitch of individual notes;

first memory means responsive to said input key switch means for storing duration information in duration words;

second memory means make separate words responsive to said digit keys for storing said numbers corresponding to said pitch information in pitch words separate and spaced apart from said duration words; and

means responsive to the information stored within said first and second memory means for generating audible sounds in response thereto.

4,450,744

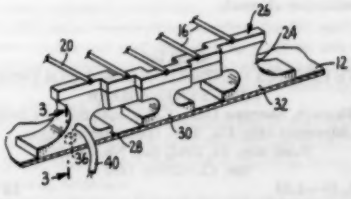
ELECTRIC PICKUP DEVICE FOR A MUSICAL INSTRUMENT SUCH AS A BANJO

Richard Shubb, P.O. Box 5311, Berkeley, Calif. 94705

Filed May 28, 1982, Ser. No. 382,957

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **13 Claims**



1. A bridge element and electric pickup for use in a banjo, comprising:

a support element having a support surface for engaging and supporting the strings of a banjo, and a plurality of feet on

the side of said element oposite said support surface for resting against the head of a banjo;

a recess within one of said feet open only to the bottom of said one of said feet;

a piezoelectric pickup element disposed in said recess substantially near the bottom of said foot to be proximate to the head; and

means for connecting said pickup element with a circuit for receiving output signals from said element and converting them into audible sounds.

4,450,745

ELECTRONIC MUSICAL INSTRUMENT WITH PLURAL TONE PRODUCTION CHANNELS

Akira Nakada, and Takeshi Adachi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

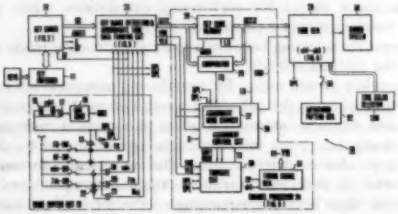
Continuation of Ser. No. 182,464, Aug. 28, 1980, Pat. No. 4,365,532. This application May 14, 1982, Ser. No. 378,057

Claims priority, application Japan, Sep. 3, 1979, 54-112580

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ G10H *1/06, 1/38*

U.S. Cl. 84—1.19 **2 Claims**



1. In a keyboard electronic musical instrument having considerably fewer tone production channels than the number of keys, the improvement comprising:

mode selection means for selecting either a first or a second playing mode;

assignment means, cooperating with said mode selection means, (a) for assigning any depressed key to any tone production channel when said first playing mode is selected, and (b) for assigning depressed keys for a certain group only to tone production channels in a certain subset for said channels and for assigning keys not in said certain group only to the remaining tone production channels when said second playing mode is selected; and

different tone quality imparting means, operative only when said second playing mode is selected, for imparting one tonal quality to tones generated in tone production channels of said certain subset and for imparting a different tonal quality to tones generated in said remaining tone production channels.

4,450,746

FLUTE CHORUS GENERATOR FOR A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 24, 1982, Ser. No. 411,159

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.24 **10 Claims**

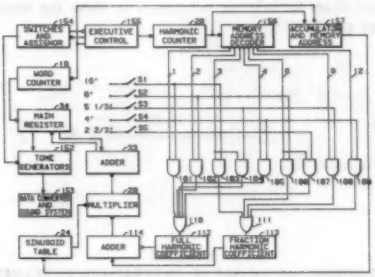
1. In a keyboard musical instrument having a number of tone generators, in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed and transferred sequentially to a digital-to-analog converter to be converted into musical waveshapes, apparatus for simultaneously generating a chorus of similar tones each at a preselected tone footage comprising;

a plurality of tone switches each corresponding to a tone footage,

a coefficient memory for storing a set of harmonic coefficient values,

a harmonic number generating means whereby a sequence of harmonic numbers is generated and wherein said sequence is equal to the number of harmonic coefficient values comprising said set of harmonic coefficient values,

a first address decoder means responsive to said sequence of harmonic numbers whereby a subsequence of harmonic numbers is generated by selecting prespecified ones of said sequence of harmonic numbers and wherein said subsequence of harmonic numbers is less in number than said set of harmonic coefficient values,



a means for computing, responsive to said set of harmonic coefficient values, whereby said plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed,

a coefficient select means responsive to the actuation of said plurality of tone switches and responsive to said subsequence of harmonic numbers whereby selected harmonic coefficient values from said set of harmonic coefficient values are read out from said coefficient memory and provided to said means for computing, and

a means for producing musical waveshapes from said plurality of data words thereby generating said chorus of similar tones each one at a tone footage corresponding to the actuation of one of said plurality of tone switches.

4,450,747

MUFFLER ASSEMBLY FOR A PIANO

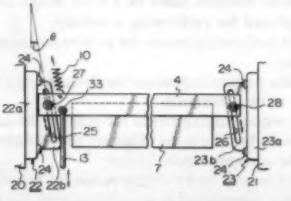
Kikuro Aoyama, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 16, 1982, Ser. No. 358,681

Claims priority, application Japan, Mar. 19, 1981, 56-038416[U]

Int. Cl.³ G10C *3/26*

U.S. Cl. 84—220 **4 Claims**



1. A muffler assembly for a piano having a plurality of hammers arranged side by side in a row, said muffler assembly comprising

a muffler rail horizontally extending along said row of said hammers and having a projection formed at each end of said muffler rail,

a muffler felt coupled to and hanging downward from said muffler rail,

a pair of guide blocks mounted to said piano, each of said guide blocks facing one end of said muffler rail and provided with a guide slot which is located in a vertical plane parallel to said muffler rail, each of said guide slots extending with a slight inclination with respect to the vertical direction and adapted for slidable engagement with one of said projections formed on said ends of said muffler rail,

urging means for resiliently urging said muffler rail to move upwards, and

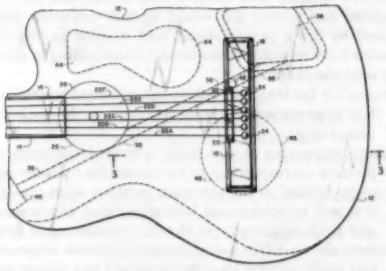
intermediate links coupling said muffler rail to a soft pedal of said piano so that, when said soft pedal is stepped on, said muffler rail is pulled downwards against the operation of said urging means in order to place said muffler felt in front of said hammers.

4,450,748

SOLID BODY GUITAR WITH SEALED CAVITY

Timothy P. Shaw, and Abraham J. Wechter, both of Kalamazoo, Mich., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,644
Int. Cl.³ G10D *1/08*
U.S. Cl. 84—291 **10 Claims**



1. A solid body for a musical instrument, said instrument having a bridge mounted on said body, a plurality of bass strings and a plurality of treble strings, each string being anchored at both ends to said instrument and extending over said bridge, said body having an upper surface on which said bridge is mounted and a lower surface and being characterized by a sealed cavity formed between, but not extending through said upper and lower surfaces in the area thereof substantially underlying the portion of said bridge extended over by said bass strings.

4,450,749

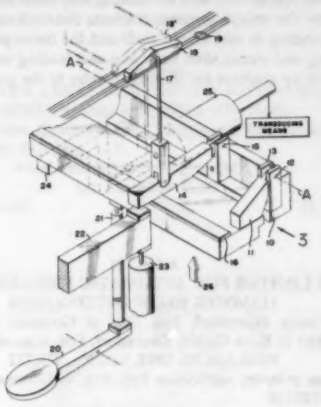
METHOD AND APPARATUS FOR RECORDING AND REPRODUCING PEDALLING EFFECTS IN A PIANO PERFORMANCE

Wayne L. Stahnke, 11434 McCune Ave., Los Angeles, Calif. 90066

Filed Apr. 23, 1982, Ser. No. 371,306
Int. Cl.³ G10G *3/04*
U.S. Cl. 84—462 **19 Claims**

6. An apparatus for recording pedalling effects in a piano performance wherein the pedal of a piano is connected through trapwork to move a member through a given distance to affect the vibrating characteristics of the piano strings, said apparatus including, in combination:

(a) a transducing means coupled to said member for generating an electrical signal whose value varies as a function of the positions of said member as it moves through said given distance; and



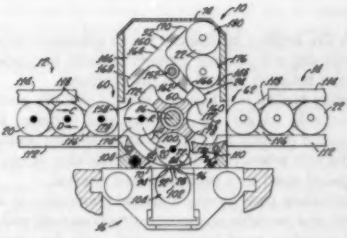
(b) a recording means including a recording medium connected to receive and record said electrical signal on said recording medium.

4,450,750

DUAL SHELL FEEDING APPARATUS, WITH SHELL ACCUMULATORS, FOR AUTOMATIC GUNS

Richard R. Gillum, Marblehead, Ohio, assignor to Ares, Inc., Port Clinton, Ohio

Filed Oct. 20, 1981, Ser. No. 313,221
Int. Cl.³ F41D *10/32*
U.S. Cl. 89—33 SF **19 Claims**



1. Dual shell feeding apparatus for an automatic gun or the like having a shell pick up position to which shells are fed for subsequent picking up and loading into a gun firing chamber for firing, and having associated first and second shell supplies located relatively adjacent the shell pick up position, the dual shell feeding apparatus comprising:

(a) feeding means mounted intermediate the first and second shell supplies and said shell pick up position, and configured for transporting, during firing of the gun, shells from either selected one of the first and second shell supplies to said shell pick up position;

(b) selecting means for prefiring selection of from which one of said first and second shell supplies said feeding means will feed shells to the shell pick up position during a next gun firing sequence;

(c) means for stopping firing of the gun with a shell from the shell supply feeding the gun left in said feeding means at said pick up position; and,

(d) shell accumulator means separate from said first and second shell supplies for removing, whenever feeding of

the gun is selectively changed by the selecting means from one shell supply to the other, from the feeding means said shell left therein and for storing said shell until the next time the selecting means reselects the shell supply corresponding to said stored shell and for thereupon transferring said stored shell back into said feeding means at said pick up position for feeding thereby to the gun.

4,450,751

FIRE LIMITER FOR AUTOMATIC FIREARMS WITH HAMMER BLOW DETONATION

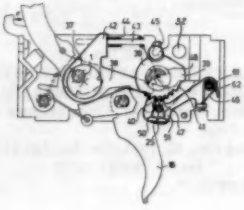
Paul Thevis, Oberndorf, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,722

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120128

Int. Cl.³ F41D *11/10*

U.S. Cl. 89—129 B **15 Claims**



1. A fire limiting mechanism for an automatic firearm, comprising a detonating hammer movable in opposite directions between cocked and fire positions,

a spring biasing said hammer toward said fire position,

a movable trigger for releasing said hammer from said cocked position for movement to said fire position,

a rotatable wheel ratchet having a plurality of ratchet teeth spaced apart by a predetermined interval,

an actuating pawl having a pivotal connection to said hammer and movable in opposite directions with said hammer,

said actuating pawl having a pawl tooth for engaging said teeth of said wheel ratchet to index said wheel ratchet through the interval of one tooth for each complete movement of said hammer in one direction,

a movable stop pawl having a spring for biasing said stop pawl against said wheel ratchet to maintain said wheel ratchet in its indexed position after being indexed by said actuating pawl,

fire disconnecting means operable to arrest said hammer in its cocked position, and

an element operable by said wheel ratchet after said wheel ratchet is indexed through a predetermined number of steps for actuating said fire disconnecting means to arrest said hammer in its cocked position,

said pivotal connection between said hammer and said actuating pawl being connected to said hammer at a location having a range of movement corresponding substantially with the interval between the teeth of said wheel ratchet whereby said actuating pawl transfers substantially the entire movement of said hammer at said location to said wheel ratchet during each complete movement of said hammer in one direction.

4,450,752

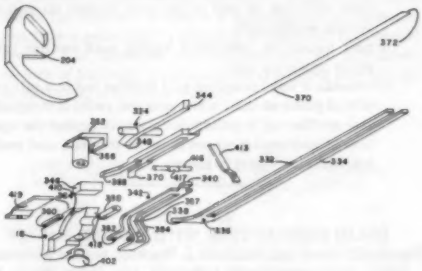
GAS OPERATED AUTOMATIC WEAPON

John S. Donovan, 16503 Santa Rosa, Detroit, Mich. 48221

Continuation of Ser. No. 47,464, Jun. 11, 1979, abandoned, which is a division of Ser. No. 874,114, Feb. 1, 1978, Pat. No. 4,210,060, which is a continuation-in-part of Ser. No. 829,716, Sep. 1, 1977, abandoned. This application Dec. 29, 1980, Ser. No. 220,539

Int. Cl.³ F41D *11/02*

U.S. Cl. 89—142 **2 Claims**



1. In an automatic weapon of the type having an automatically reciprocable bolt adapted to extract ammunition rounds from the chamber and force a new round into the weapon chamber and secure the round against rearward pressures created by firing of said round, said weapon having a mode selector lever movable to positions corresponding to automatic and semi-automatic fire,

means for latching said bolt in the rearward position of said bolt after extraction of said ammunition, the improvement comprising:

means responsive to said mode selector lever being in said position corresponding to automatic fire to cause said bolt to be latched in the rearward position upon cessation of fire; and to release said bolt after firing of a round with said mode selector lever in said semi-automatic fire;

selectively operable means including means responsive to said mode selector lever being moved to a release position other than said automatic or semi-automatic fire positions to cause release of said bolt from said latched rearward position to thereby enable manual release of said bolt after cessation of automatic fire.

4,450,753

ELECTRO-HYDRAULIC PROPORTIONAL ACTUATOR

Habil S. Basrai, Port Huron, Mich., and Ganesh Rajagopal, Richardson, Tex., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 12, 1980, Ser. No. 149,065

Int. Cl.³ F15B *21/02, 9/03, 9/09*

U.S. Cl. 91—35 **8 Claims**

1. An electro-hydraulic proportional actuator, comprising:

an actuator assembly having a double-acting, linearly-movable piston contained in a cylinder having a chamber at each end;

a pair of three-way solenoid valves each of which has an actuator port, an inlet port and an outlet port;

each end chamber of the actuator assembly cylinder being coupled to the actuator port of one of the valves,

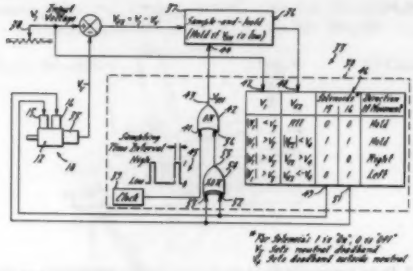
and each valve inlet port being coupled through a check valve to a fluid pressure source and the return ports being coupled to each other with the fluid flow therefrom being routed to a flow control valve;

and an electronic control system for operating the solenoid valves to direct fluid flow into and out of the cylinder chambers, comprising:

an operator control means providing an input voltage representing a desired actuator assembly piston position,

a transducer means coupled to the actuator assembly to generate an output voltage representing the actual position of the piston,

the difference between the input and output voltages generating a difference signal representing the difference between the actual and desired positions of the piston,



a feedback system including a sample-and-hold circuit in a feedback path having an input to receive the difference signal,

and a clock logic means for transmitting the difference signal from the feedback system to the solenoid valves at predetermined intervals to activate either valve to move the actuator piston in either direction or to activate both valves to hold the piston at a desired position.

4,450,754

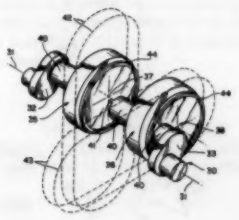
MECHANICAL ARRANGEMENTS FOR PISTON-CRANKSHAFT DEVICES

Jon L. Liljequist, 801 S. Elmhurst Ave., Mount Prospect, Ill. 60056

Continuation-in-part of Ser. No. 322,361, Nov. 16, 1981, Pat. No. 4,428,197, which is a continuation-in-part of Ser. No. 178,711, Aug. 18, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,639

Int. Cl.³ F01B 9/00

U.S. Cl. 92—138 **17 Claims**



1. In a device defining internally therein a piston chamber having an internal sidewall, said device also including a crankshaft having both an axis of rotation and an eccentric portion having another axis offset therefrom, the improvement comprising:

eccentric disc means moveably contained within said piston chamber and having a generally circular periphery that is in essentially continuous tangential contact with the piston chamber sidewall for receiving at least the major portion of the side force exerted by the sidewall;

said eccentric disc means being eccentrically mounted on said crankshaft for rotation relative thereto around its offset axis at the same angular speed as said crankshaft but in the opposite direction, said eccentric disc means also having a centroidal axis parallel to the crankshaft's offset axis so that the direction of movement of the eccentric disc within the piston chamber is at a 90° angle relative to the eccentric disc means' centroidal axis.

4,450,755

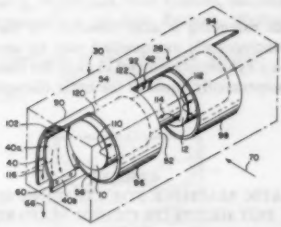
AIR BLOWER ARRANGEMENT FOR PRODUCING AIR SCREEN AND RELATED METHOD

Robert S. Catan, Smithtown, N.Y., assignor to Dynaforce Corporation, Old Bethpage, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,576

Int. Cl.³ F24F 9/00

U.S. Cl. 98—36 **23 Claims**



17. A method comprising rotationally impelling air by a blower along a determinable, generally circular path while taking said air into said path from at least one axial direction and discharging the air tangentially of said path with an axial spread to form at least part of an air curtain having a width exceeding the breadth of said circular path, and blocking the air, which is being tangentially discharged and which is in the axial spread, from returning into said circular path while guiding the air along a tangential path, thereby to optimize the pressure of air in the curtain, the rotation of the air along said path by the blower being controlled by an open ended scroll having a first portion forming a cutoff zone with the blower, a second portion encircling the blower and a third portion extending from said second portion in a direction substantially parallel to a tangent to the blower, and also extending axially beyond the blower, to form a discharge outlet for the rotary flow of air, including said axial spread, conveyed through the scroll by the blower, the blocking of the air in the axial spread being effected by an interception plate which is radially spaced from the periphery of the blower and from the scroll so as to be radially positioned in entirety therebetween, in spaced relation from both, said interception plate formin and guiding the axial spread of air in a passage between the plate and the part of the scroll extending axially beyond the blower, whereat the plate is substantially parallel to and in juxtaposition with said third portion of the scroll at a relatively small spacing for peeling off the rotary air flow and conveying the same in said curtain for tangential discharge.

4,450,756

FUME EXHAUSTER DEVICE

Miguel Kling, Seestrasse 38, D-8131 Berg, Fed. Rep. of Germany

Continuation of Ser. No. 070,055, Aug. 27, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 336,934

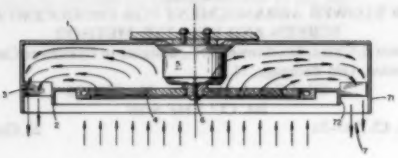
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837543

Int. Cl.³ F24F 9/00

U.S. Cl. 98—115 R **17 Claims**

1. A fume exhauster device comprising means for generating an air current directed substantially axially, and for directing said air current concentrically surrounding said air current directed axially and having one axial flow-component directed

substantially opposite to the flowing direction of said air current directed axially and a second circulating flow-component surrounding said air current directed axially, characterized in that said means comprises a substantially annular exit opening defined at least along its outer periphery boundary by a periph-



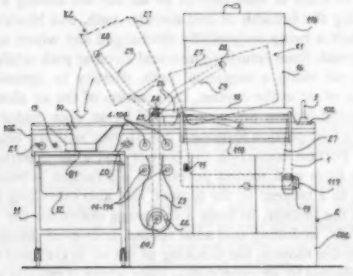
eral surface extending in axial direction for forming said air current concentrically surrounding said air current directed axially into a cylindrical integral shroud, the outer diameter of which is substantially equal to the outer diameter of said exit opening.

4,450,757

AUTOMATIC MACHINE FOR COOKING SOUP-PASTE, RICE, POT HERBS OR OTHER FOOD-STUFFS IN WATER

Po Alfio, Mantegna-Carpi, Italy, assignor to Angelo Po Grandi Impianti S.p.A., Carpi, Italy

Filed Sep. 20, 1982, Ser. No. 419,838
Int. Cl.³ A47J *27/18*
U.S. Cl. 99—327 **10 Claims**



1. An automatic machine for cooking food including soup-paste, rice or pot herbs, comprising:

a support structure having a base and an upper working plane;

an open cooking tank contained within said support structure above said base and below said working plane having an overflow duct;

a movable basket pivotally supported on said working plane;

water supply means for supplying water to said tank at a predetermined temperature;

at least one burner for heating water in said tank;

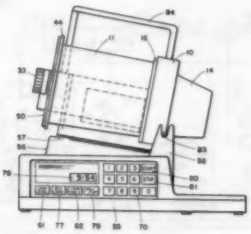
water circulation means associated with said tank and housed within said support structure for circulating cooking water at a predetermined temperature through said tank for intermixing with the water supplied by said water supply means and maintaining the temperature of the water in said tank at a predetermined temperature while maintaining the level of the cooking water at a predetermined level and forcing the water to exit through said overflow duct, for the removal of the cooking water in said tank, of particles suspended in the water including starch and scums through said overflow duct.

4,450,758

ROTARY COOKING DEVICE

Irving R. Belinkoff, 80-65 231st St., Bellerose Manor, N.Y. 11427, and Bruno Satkunas, 7 Oak Ridge Ave., Summit, N.J. 07901

Filed Jan. 4, 1982, Ser. No. 336,998
Int. Cl.³ A47J *27/62*
U.S. Cl. 99—332 **7 Claims**



1. In an automatic food cooker including a rotatable cooking vessel having an open end and a closed end, driving means for rotating the vessel, a lid for closing the open end of the vessel, a housing for containing the driving means and supporting the vessel, means carried by the housing for heating the vessel, and means for controlling the temperature of the heat applied to the vessel, the improvement comprising:

(a) a pivot assembly carried by the housing for engaging the lid of the vessel and securing the vessel in position on the housing for rotation by the driving means; and

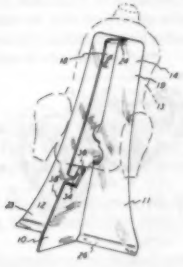
(b) means carried by the lid for engagement with the pivot assembly to permit rotation of both the lid and the vessel with respect to the pivot assembly.

4,450,759

STAND FOR FOWL ROASTING

James P. Steibel, 4822 - 57th Dr., Sturtevant, Wis. 53177

Filed Apr. 29, 1983, Ser. No. 489,724
Int. Cl.³ A47J *43/18*
U.S. Cl. 99—419 **5 Claims**



5. A stand for fowl roasting, comprising two plates of flat material having uniform thickness and being planar and uprightly disposed, said plates being positioned in respective vertical planes at an angle to each other and having upright slots therein and being slid into said slots of each other with said plates being in a crossed position and thereby present an uprightly self-standing combination of said two plates, said plates being slidable away from each other for disassembly, the upper ends of each said plates being narrower than the lower respective ends thereof for inserting into a cavity in a fowl, and at least one of said two plates including a portion offset from the plane of the remainder of said one plate, and with said portion being within the extent of the height of the other of

said two plates and in abutment with said other of said two plates to thereby retain said two plates in their said crossed position and avoid collapsing of said two plates toward each other.

4,450,760

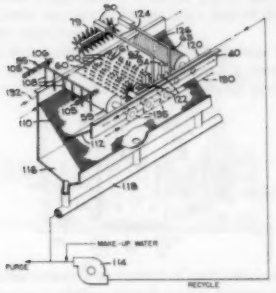
APPARATUS FOR REMOVING ROT FROM POTATOES

Donald C. Wilson, San Jose, Calif., assignor to PMC Corporation, Chicago, Ill.

Division of Ser. No. 331,092, Dec. 14, 1981, Pat. No. 4,394,398. This application Apr. 18, 1983, Ser. No. 486,165

Int. Cl.³ A23L *1/216*

U.S. Cl. 99—536 13 Claims



1. An apparatus for removing decayed portions from the exterior of potatoes, comprising:

a plurality of rollers forming a path for supporting and guiding said potatoes,

means for impelling said potatoes along said path formed by said rollers,

means defining a plurality of rubber fingers on a portion of said rollers for contacting substantially all surfaces of the potatoes with said rubber fingers with sufficient force to penetrate the decayed areas of the potato surface without damaging the flesh of sound portions of the potato,

nozzles for directing streams of water at said potatoes, said potatoes being positioned by said rollers to receive said streams over the entire surface of the potatoes; and

means for providing water to said nozzle means with sufficient pressure so that the resulting streams will disrupt and remove decayed portions opening to the surface of the potatoes while leaving the remaining surface area of the potatoes intact.

4,450,761

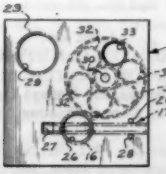
NUTCRACKER TABLE

Hillard W. Bailey, 754 Cravens Ave., San Antonio, Tex. 78223

Filed Mar. 21, 1983, Ser. No. 456,867

Int. Cl.³ A23N *5/00*

U.S. Cl. 99—580 1 Claim



1. A nutcracker table, comprising, in combination, a table-top mounted upon a pair of legs having a stretcher cross-bar therebetween, and a wide foot at a lower end of each said leg; a first and second, spaced-apart, circular openings through said table-top for removably fitting flanged receptacles therein respectively to contain unshelled nuts and receive broken nut shell particles, a square opening and a pair of pegs on said table-top being located at opposite sides of said second opening for stationarily supporting a Texas Native Nutcracker therebetween and bridging across said second opening; and a rotatable, circular tray under said table-top supporting a plurality of receptacles and a third circular opening through said table-top for selective alignment with said tray-supported receptacles for receiving unshelled nuts.

4,450,762

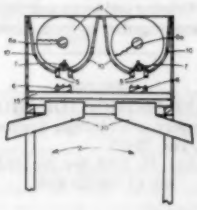
ONION PEELING MEANS

Thomas P. Lustig, Wellington, New Zealand, assignor to Development Finance Corp. of New Zealand, Wellington, New Zealand

Filed Jun. 4, 1982, Ser. No. 385,011

Int. Cl.³ A23N *7/00*

U.S. Cl. 99—584 10 Claims



1. Apparatus for peeling an onion (as herein defined) by scorching the skin thereof, said apparatus including a bed to support the onion during said scorching, said bed comprising a plurality of spaced apart, substantially parallel rails;

a worm conveyor having a longitudinal axis and a helical periphery, means for rotatably mounting said worm conveyor with said longitudinal axis extending substantially parallel to said rails and with said periphery positioned relative to said rails whereby rotation of said worm conveyor will cause an onion supported by said rails to be conveyed along said rails; and

heating means for directing heat towards the onion being conveyed along said rails, said heating means being adjustable to provide heat of sufficient intensity for scorching the skin of the onion while being conveyed substantially the length of said rails.

4,450,763

APPARATUS FOR FORMING WIRE CONNECTION

Millard P. Saylor, 1125 W. Greenbrier, Arlington Heights, Ill. 60004

Continuation-in-part of Ser. No. 273,252, Jun. 12, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 459,945

Int. Cl.³ B65B *13/28*

U.S. Cl. 100—31 20 Claims

1. An apparatus for automatically applying and connecting a continuous loop of wire to a bale of material comprising:

gripper means for gripping two end portions of overlapping sections of wire looped around the bale of material;

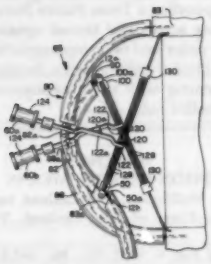
twister means operatively mounted to contact said wire at a pair of points spaced from the end portions;

looper means adapted to contact the wire at points intermediate of said gripper means and said twister means;

said looper means acting to swing the portions of said wire disposed between said looper means and said gripper means into adjacent relationship with the remaining portion of the wire between said gripper means and said

twister means to form a pair of loops upon release of the wire by said gripper means;

said looper means being arranged to cause said formed loops of wire to interconnect; and



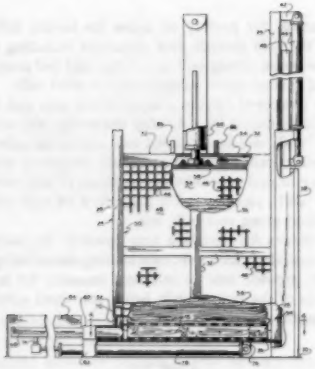
said twister means acting to contact an area of said adjacent wire portions forming said loops and twisting some of said adjacent portions together to form a connection.

4,450,764

HIDE PRESS AND METHOD FOR SHIPPING HIDES

Preston D. Montgomery, c/o Multiple Systems, Inc., P.O. Box 15025, Amarillo, Tex. 79105

Filed Aug. 27, 1982, Ser. No. 412,265
Int. Cl.³ B30B *9/02*
U.S. Cl. 100—37 **15 Claims**



13. The process involving pallets having:

a. a top adapted to hold animal hides,

b. a flat bottom,

c. at least one void between the top and bottom that is accessible through at least one side opening therebetween,

wherein the improved method of shipping animal hides comprising the steps of:

d. stacking wet hides on one of the pallets,

e. placing the pallet with the wet hides within a container having vertical sides, a flat bottom plate, and flat top plate,

f. compressing the hides on the pallet by

g. pressing the pallet and hides between the bottom and top plates within the vertical sides until a selected pressure on the hides is obtained,

h. maintaining the selected pressure for a desired period, thereby

i. squeezing liquids from the wet hides,

ii. compacting the hides into cohesive bundles, thus

j. forming bundles of hides on the pallets with flat vertical sides and flat tops,

k. removing the pallets with the dryed, compacted, formed hide bundles thereon from the container,

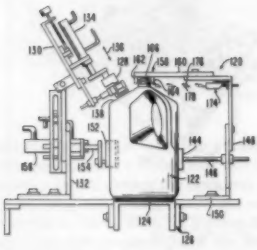
l. stacking the pallets and hide bundles on top and close beside one another for shipment.

4,450,765

APPARATUS FOR BRANDING MILK CARTONS

Roger C. Van Steenkiste, 5012 Forni Dr., Concord, Calif. 94520

Continuation of Ser. No. 282,831, Jul. 13, 1981, abandoned. This application Oct. 25, 1983, Ser. No. 546,061
Int. Cl.³ B41F *17/24*
U.S. Cl. 101—11 **1 Claim**



1. Apparatus for marking a plurality of plastic containers one-by-one with each container having a neck and a flat side wall comprising: a conveyor for supporting and moving the containers in upright positions along a predetermined path; means for applying indicia to each container, respectively, when the container is at a predetermined location along the path, said applying means including a heated die having indicia thereon, means including a tiltable support plate on one side of the conveyor for mounting the die for movement transversely of said path and toward and into heat exchange relationship with the side wall of a container to be branded with the indicia on the die, and a flexible inked web between the die and a container at said predetermined location for transferring ink from the web to the branded portion of a container at said predetermined location, said die being engageable with one side of a segment of the web and operable to shift said web segment into engagement with a container at said predetermined location, there being means coupled with the web for incrementally advancing the web past the die; means including a reciprocal rod on the opposite side of the conveyor from the applying means for releasably holding the neck of a container at said predetermined location against movement relative to the applying means as the conveyor supports the container and as the container is branded by the die; and second holding means including a pair of holding members on opposite sides of the conveyor for engaging the side wall of a container at said predetermined location, one of the members being shiftable, the other member being fixed.

4,450,766

UNIT-TO-UNIT REGISTER ADJUSTING APPARATUS OF MULTICOLOR PRINTING MACHINE

Takehiro Inomata, Ibaragi, and Nobuya Oyabu, Chiba, both of Japan, assignors to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,597
Claims priority, application Japan, Jul. 21, 1981, 56-114273
Int. Cl.³ B41F *5/02, 7/06*
U.S. Cl. 101—183 **13 Claims**

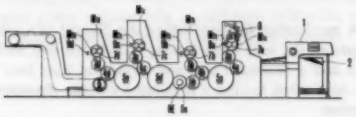
1. A unit-to-unit register adjusting apparatus of a multicolor printing machine including a plurality of plate cylinders, said apparatus comprising:

a single substantially triangularly shaped register mark applied to respective plate cylinders, each register mark having a first side extending laterally of axial direction of a plate cylinder and a second inclined side extending downwardly to an end of said first side;

a register mark detector including a projector for projecting light on said register mark and a light receiver for receiving light reflected by said register mark such that said register mark detector generates an output signal including an output pulse corresponding to the alignment of said register mark detector with said register mark as said plate cylinder rotates;

a rotary encoder rotating in synchronism with respective plate cylinders for generating a reference signal having a reference pulse and a rotation signal having a rotation pulse, said rotation pulse having a period shorter than that of said reference pulse;

an input unit comprising gain control means for controlling said output pulse of said register mark detector to have a predetermined peak value, and signal processing means



for differentiating an output of said gain control means for producing a differentiated signal having a leading edge pulse and a trailing edge pulse corresponding to leading and trailing edges of the output of said gain control means, respectively;

time difference detecting means responsive to time differences between said leading edge pulse and said rotation pulse and between said trailing edge pulse and said rotation pulse for generating a leading edge time difference signal and a trailing edge time difference signal;

integrating means provided for said time difference detecting means for independently integrating said leading edge time difference signal to generate a leading edge integrated signal and said trailing edge time difference signal to generate edge integrated signal;

first adjusting means responsive to said leading edge integrated signal for adjusting the relative phase angles of respective plate cylinders in the peripheral direction; and

second adjusting means responsive to said trailing edge integrated signal for adjusting lateral positions of respective plate cylinders.

4,450,767

REMOTE CONTROL SYSTEM FOR INK ZONES IN PRINTING MACHINES

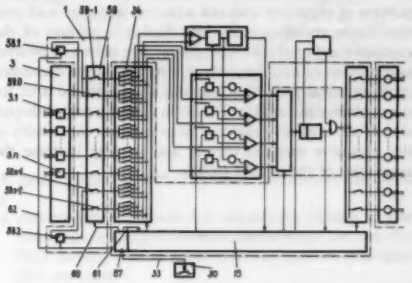
Karl-Heinz Förster, Dresden; Hans Johne, Radebeul; Helmut Schuck, Coswig, and Ludwig Friedrich, Dresden, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 451,546, Dec. 21, 1982. This application Jan. 20, 1983, Ser. No. 459,620

Int. Cl.³ B41F *31/04*

U.S. Cl. 101—365 **2 Claims**

1. In a control system for adjusting an ink zone in a printing machine, including a continuous ink blade, a series of setting keys engaging the blade, a key setting unit including a plurality of setting drives and a plurality of key position sensors assigned respectively to the keys, a first multiplexer for sequentially switching over the position values measured by the position sensors, a second multiplexer for selectively activating said setting drives, a single drive control unit connected to said second multiplexer, a comparing differential transducer for comparing during an adjusting cycle, consecutive pairs of values measured by the position sensors, a calculating unit for calculating correction values when the output from the differential transducer exhibits a predetermined limit value, a main ink flow control unit connected to said first and second multiplexers, to said calculating unit, and to said drive control unit, and an additional adjusting device comprising a switching unit arranged between said first multiplexer and said key position sensors to apply actual measured value from said sensors via said first multiplexer to the comparing differential transducer



and to the calculating unit, said switching unit including additional contacts assigned to imaginary position sensors adjoining the position sensors, a 23 pair of sample-and-hold members each having an input connected to said position sensors, and an output connected to said additional contacts of the switching unit, and an auxiliary ink flow control unit triggered by a release circuit for activating at the beginning of an adjusting cycle said sample-and-hold members and said switching unit.

4,450,768

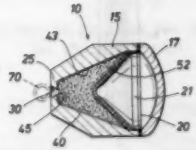
SHAPED CHARGE AND METHOD OF MAKING IT

William T. Bell, Sugarland, Tex., assignor to Schlumberger Technical Corporation, Houston, Tex.

Continuation of Ser. No. 224,588, Jan. 12, 1981, abandoned. This application Mar. 25, 1983, Ser. No. 479,063

Int. Cl.³ F42B *3/08*

U.S. Cl. 102—307 **8 Claims**



1. A method for fabricating a shaped charge, comprising:

(a) forming a hollow case having a rear wall and an open end opposite the rear wall,

(b) forming a detonating bore in the rear wall of the hollow case,

(c) forming an outwardly convex end in the detonating bore,

(d) loading explosive powder material into the case substantially only through the open end thereof, and

(e) compacting the explosive material within the case into a shaped charge, through the open end thereof and toward and against the rear wall thereof, to cause a portion of the explosive to enter the detonating bore and the convex end thereof and be less compacted and less dense in the convex end than in substantially the remainder of the explosive within the hollow case, for increased sensitivity and better and more reliable detonation of the shaped charge.

7. A shaped charge, comprising:

a charge casing having side wall portions and a rear wall

portion defining an inner cavity with a frontal opening therein,

wall portions defining a detonating bore through said rear wall portion wherein said bore has a decreasing cross-sectional area proximate to said inner cavity,

whereby the loading of explosive material into said inner cavity through said frontal opening and the compacting of the explosive material through said frontal opening and toward said rear wall portion will define a compacted portion of explosive material adjacent said rear wall portion while simultaneously introducing a portion of the explosive material into said detonating bore and beyond said portion of said detonating bore having the decreased cross-sectional area, and whereby the increased area for the explosive material will result in at least a partial dispersion of the explosive material so as to lessen the density of the explosive material therein and thereby increase the sensitivity of the shaped charge.

4,450,769

DUMMY AMMUNITION

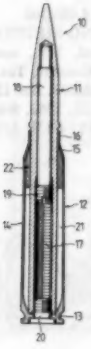
Franz Moser, Fehraltdorf, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Bührle AG, Zurich, Switzerland

Filed Jun. 1, 1982, Ser. No. 383,817

Claims priority, application Switzerland, Jun. 24, 1982, 4173/81

Int. Cl.³ F42B *5/22*

U.S. Cl. 102—444 **5 Claims**



1. A dummy cartride comprising:

a cartridge case containing a case floor portion, a substantially cylindrical case wall, a substantially conical shoulder portion and a mouth portion;

a dummy body member inserted into the cartridge case and bearing against the case floor portion;

said dummy body member having opposed ends;

means for securing one end of said dummy body member to said floor portion of said cartridge case;

a further portion of said dummy body member being attached to said mouth portion of said cartridge case;

said dummy body member possessing a substantially cylindrical axially directed hollow compartment which is open towards said case floor portion; and

an axially displaceable trim body inserted into said hollow compartment, in order to axially displace the position of the center of gravity of the dummy cartridge while maintaining its weight.

4,450,770

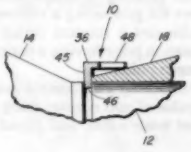
PIVOT RING FOR A DISCARDING SABOT

Richard D. Kirkendall, Havre de Grace; William H. Drysdale, Aberdeen, and Louis D. Kokinakis, Fallston, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 184,715, Sep. 8, 1980, abandoned. This application Jan. 31, 1983, Ser. No. 462,288

Int. Cl.³ F42B *13/16*

U.S. Cl. 102—523 **8 Claims**



1. A mechanism for controlling the discard of a sabot from a subprojectile, said sabot having a forward end including a pocket and a rearward end and having at least two components, said sabot having a maximum outside diameter which comprises:

a separate ring-like holding means fixing the location of said sabot in peripheral pivotal contact at its rearward end with said subprojectile, and

a groove-like means in and around the periphery of said subprojectile, for affixing said ring-like holding means thereto; wherein said ring-like holding means has a smaller diameter than said maximum outside diameter of said sabot and has an interior leg and an exterior leg, said exterior leg holding the rearward end of said sabot in contact with said subprojectile and said interior leg being disposed in said groove-like means, thereby sealing the interface of the rearward end of said sabot with said subprojectile to prevent leakage of propellant gases through said interface, whereby when the subprojectile and sabot leave the gun muzzle, aerodynamic forces act on the sabot pocket to lift the forward ends of the sabot components from the subprojectile, while the rearward ends of the sabot components are restrained against radial and axial movement by said ring-like holding means and pivot about said holding means.

4,450,771

MOBILE BALLAST CLEANING MACHINE

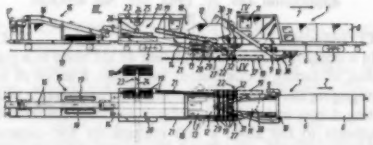
Josef Theurer, Vienna, and Karl Fölser, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 29, 1982, Ser. No. 343,527

Claims priority, application Austria, Mar. 4, 1981, 1006/81

Int. Cl.³ E01B *27/10*

U.S. Cl. 104—1 R **9 Claims**



1. A mobile ballast cleaning machine comprising

(a) a frame mounted on two undercarriages for mobility along a track supported on the ballast resting on a subgrade,

(b) a ballast excavating means mounted on the frame be-

tween the two undercarriages for removing ballast from under the track to expose the subgrade,

(c) a ballast screening means arranged on the frame to receive the removed ballast from the ballast excavating means and to discharge cleaned ballast and waste,

(d) conveyor band means for carrying away the waste and for redistributing the cleaned ballast, the ballast redistributing conveyor band means having a discharge end and an exposed subgrade zone being defined between the ballast excavating means and the discharge end for laying a succession of rigid foam plates on the exposed subgrade, and

(e) apparatus for handling the rigid foam plates, the apparatus including

(1) a plate receiving and transfer station,

(2) an elongated plate conveying path extending from the station to the zone for conveying successive ones of the plates in a direction substantially parallel to the track, and

(3) a plate turning and laying mechanism in said zone receiving the successive rigid foam plates from the conveying path, for turning the plates and for laying the turned plates successively in said zone under the track in a position extending transversely to the track.

4,450,772

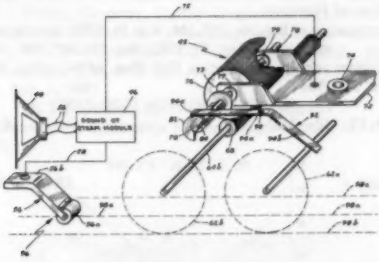
TENDER-MOUNTED SOUND SYSTEM FOR TOY STEAM LOCOMOTIVE

James R. Van Sickle, New Baltimore, Mich., assignor to CPG Products Corp., Minneapolis, Minn.

Filed Jan. 27, 1982, Ser. No. 343,126

Int. Cl.³ A63H *17/34*; B60L *1/00*

U.S. Cl. 104—295 **12 Claims**



1. In combination, a toy steam locomotive comprising first wheel means including at least one pair of laterally spaced wheels of one diameter, a tender for said locomotive including second wheel means including at least one pair of laterally spaced wheels of another diameter, sound generating means carried on said tender, switch means in circuit with said sound generating means, and means mechanically connected to said second wheel means for opening and closing said switch means to energize and de-energize said sound generating means in a synchronized relation with the rotation of said first wheel means, said means for opening and closing said switch means including a first rotatable member of one diameter and a second rotatable member of another diameter, the ratio of said last-mentioned diameters being inversely proportional to the ratio of the diameters of said first and second wheel means.

4,450,773

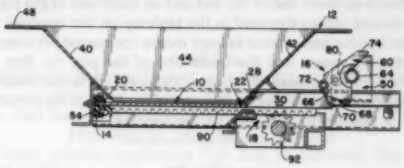
SLIDING GATE FOR A RAILROAD HOPPER CAR

William E. Fritz, Naperville, Ill., and Ronald J. McComb, Youngstown, Ohio, assignors to The Youngstown Steel Door Co., Cleveland, Ohio

Filed Jan. 23, 1981, Ser. No. 227,861

Int. Cl.³ B61D *7/20*, *7/22*, *7/26*

U.S. Cl. 105—282 A **6 Claims**



1. A slide gate assembly for a railroad hopper car comprising:

a closure door adapted for selectively closing a bottom discharge opening in an associated hopper car, the closure door having a front portion, a rear portion, and opposed side portions;

a support assembly in which the closure door is mounted adjacent its side portions for horizontal movement between open and closed positions, the support assembly being adapted for mounting to the underside of an associated hopper car;

an automatic locking means for automatically locking the closure door in the closed position, the locking means including first and second dog means connected by an axle pivotally mounted on the support assembly, the dogs and the closure door rear portion having complimentary engaging surfaces to lock the closure door in the closed position, the dogs being biased by gravity toward orientations in which the complimentary engaging surfaces are in engagement; and,

a connecting rod extending between the first and second dog means displaced from and generally parallel to the axle.

4,450,774

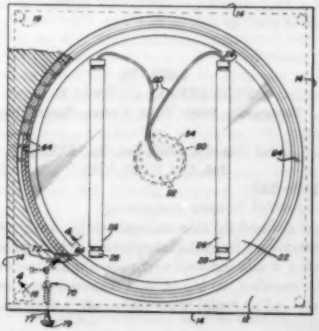
DRAFTING AND DRAWING TABLE

Johnny L. Weaver, 13555 McCall Ct., NE., Albuquerque, N. Mex. 87123

Filed May 20, 1982, Ser. No. 380,465

Int. Cl.³ A47B *11/00*

U.S. Cl. 108—23 **8 Claims**



1. A drafting table assembly comprising a tabletop having a generally planar work surface and having an enlarged circular opening therein, a flat circular disc disposed in said opening in coplanar relation to the tabletop, the circular disc and the

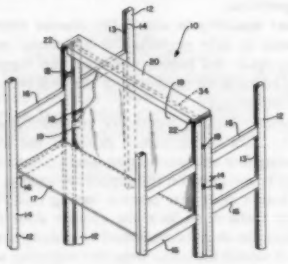
tabletop having convex-concave interfacing elements therebetween, a retractable pin within the tabletop for engaging with one of a series of equally spaced pin receiving holes disposed along the interfacing element of the circular disc, an actuating rod extending from one edge of the tabletop for controlling engagement of the pin with said holes, the actuating rod being disposed at an angle to the pin on one side of a plane containing the longitudinal axis of the pin, first linkage means connected between an inner end of the rod and an outer end of the pin, an anchoring means disposed in the tabletop on the opposite side of said plane, and second linkage means connected between the anchoring means and the outer end of the pin, the first and second linkage means effecting withdrawal of the pin from one of said holes responsive to outward movement of the actuating rod in relation to said edge of the tabletop.

4,450,775

MERCHANDISE DISPLAY DEVICE

David A. Brendle, 525 E. Bluebonnet La., Hoffman Estates, Ill. 60195

Filed Jan. 17, 1983, Ser. No. 458,661
Int. Cl.³ A47B *47/00*
U.S. Cl. 108—64 **3 Claims**



1. A display device, comprising:
at least four pairs of upright members, each pair having two uprights adjoined by braces extending between facing edges thereon, each upright of said pair having a groove along said facing edge;
a plurality of retainer clips securing said upright pairs in series fashion, forming thereby two units of two pair each;
a gondola cap joining said units in parallel array, having a tang at each end friction fitted into the said grooves of said uprights joined by said retainer clips; and
at least a shelf secured in horizontal fashion to one of said braces in each of said units.

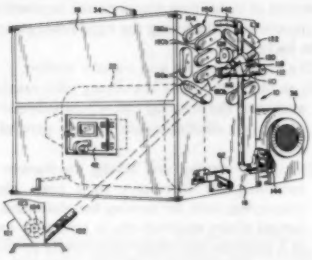
4,450,776

INDUSTRIAL FURNACE

Robert L. Stevenson, 9003 West Evans, Rogue River, Oreg. 97537

Filed Jun. 10, 1983, Ser. No. 503,342
Int. Cl.³ F23B *7/00*
U.S. Cl. 110—233 **10 Claims**

1. An industrial furnace comprising
a firebox defined by side and end walls, a top wall, and a floor having a solid fuel supporting grate assembly,
an opening in said top wall vertically aligned over said grate,
a tubular member having an inlet disposed exteriorly of said furnace and an outlet in communication with said top wall opening,
means at the inlet of said tubular member for admitting a solid fuel in particle form,
a power driven auger in said tubular member arranged to move solid fuel particles from said inlet to said outlet for deposit by gravity on said grate,
a heating chamber above said firebox having a top wall and end and side walls,
forced air means forcing air from an exterior inlet through said heating chamber to an outlet for heating use,
an outlet stack supported on said heating chamber,
heat exchange means communicating with said firebox and circulating through said heating chamber to said stack for discharging heat exchanged exhaust gases for heating the moving air in said heating chamber,



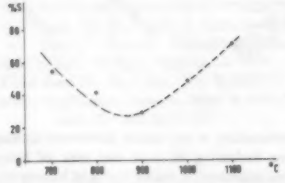
controllable volume forced air draft means leading inwardly from the exterior of said furnace and directed upwardly through said grate for forcing combustion,
and controllable volume forced air inlet means leading from the exterior of said furnace to said stack to provide an induced draft up said stack to aid combustion and circulation of products of combustion through said heat exchange means.

4,450,777

PROCESS FOR REMOVING NOXIOUS SUBSTANCES CONTAINING FLUORINE AND/OR SULFUR FROM GASEOUS OR LIQUID MEDIA

Erhard Wolfrum, Düren; Manfred Erken, Bergheim-Niederaussem, and Dietrich Böcker, Brühl, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 305,246, Sep. 24, 1981, abandoned. This application Apr. 27, 1983, Ser. No. 487,236
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1980, 3036504
Int. Cl.³ F23G *7/06*; F23B *7/00*
U.S. Cl. 110—342 **6 Claims**



1. A process for removing pollutants containing fluorine and/or sulfur from gaseous or liquid media by adsorping the pollutants on coke and subsequently incinerating the coke, characterized in that the coke to be charged with pollutants is produced from lignite (brown coal) inherently containing alkaline ash compounds finely distributed therein, and the degree to which the coke is charged is determined such that the subsequent combustion of the coke at temperatures between 700 degrees and 1050 degrees Centigrade causes the pollutants to be bound by chemical combination with the alkaline ash components in the ash.

4,450,778

SUGAR CANE BILLET PLANTER

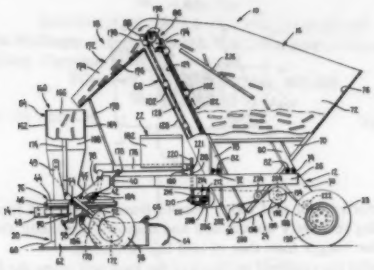
Donald J. Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

PCT No. PCT/AU80/00037, 371 Date Mar. 22, 1982, 102(e) Date Mar. 22, 1982, PCT Pub. No. WO82/00399, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 25, 1980, Ser. No. 364,939

Int. Cl.³ A01C 11/00

U.S. Cl. 111—3 7 Claims



1. A sugar cane billet planter including a frame, a hitch assembly on the frame for attaching the frame to a draft vehicle, a sugar cane billet hopper mounted on the frame and a billet metering mechanism characterized by a billet delivery assembly mounted on the frame capable of delivering billets to a furrow in the soil and an endless chain and slat conveyor mounted on the frame capable of conveying billets out of the hopper and delivering them to the cane billet delivery assembly, and including an upper roller with projection means that extend outwardly from the axis of rotation of the upper roller past the endless chain and between the slats and capable of doffing excess billets from the slats.

4,450,779

SEED DRILLS

Alfred J. Bailey, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

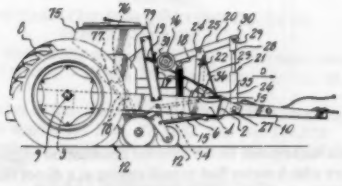
PCT No. PCT/GB82/00009, 371 Date Sep. 20, 1982, 102(e) Date Sep. 20, 1982, PCT Pub. No. WO82/02471, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 15, 1982, Ser. No. 420,181

Claims priority, application United Kingdom, Jan. 21, 1981, 8101726

Int. Cl.³ A01C 5/06

U.S. Cl. 111—52 6 Claims



1. A seed drill comprising a frame, a series of coulters mounted on the frame at positions which are spaced apart in a transverse direction relative to the direction of operative forward motion of the drill, and actuating means comprising a beam that extends in a transverse direction, thrust transmitting means connected between the beam and the coulters, and thrust applying means connected between the frame and the beam to move the beam downwards; said thrust applying means comprising at least two levers pivotally mounted on the frame with a common pivot axis extending in a transverse direction spaced from said beam and with at least one lever connected to an intermediate region in the depth of the beam, bearing means at the end of each lever that rotatably supports the beam so as to allow rotation of the beam about its longitudinal axis and tilting of the beam end-to-end relative to the levers, and actuator means connected between the frame and each lever.

4,450,780

FEEDER FOR AUTOMATIC SELVEDGING APPARATUS

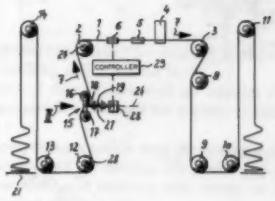
Johannes Freermann, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale KG, Ochtrup, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,869

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227197

Int. Cl.³ D05B 35/00

U.S. Cl. 112—147 8 Claims



1. In combination with an apparatus which folds over and stitches the longitudinally extending and transversely spaced edges of an elongated textile web, and which comprises:

a pair of longitudinally spaced and transversely throughgoing main rolls rotatable about respective parallel axes;

guide and drive means for passing the web longitudinally and continuously from one of the main rolls to the other main roll in a travel direction perpendicular to the roll axes and with the web spanned tightly longitudinally between the main rolls and lying generally in a plane with its edges generally parallel;

means between the upstream and the downstream main roll for folding over the edges of the web; and

sewing means between the folding means and the downstream main roll for stitching together the folded-over web edges;

a feeding apparatus comprising:

at least one straight guide spaced upstream from and substantially parallel to the upstream main roll, the web passing over the guide and thence to the upstream main roll;

a support between the guide and the upstream roll and pivotal about an axis transverse to a plane defined by the straight guide and upstream main roll axis;

an upstream and a downstream deflecting roll carried on the support and rotatable about respective at least generally parallel axes flanking the support axis, the web being spanned over and passing between the deflecting rolls; and

means for pivoting the support and deflecting rolls about the support axis for laterally deflecting the web thereat.

4,450,781

THREAD WIPING MECHANISM

Francis A. Wickers, and Adolph S. Dorosz, both of Beverly, Mass., assignors to USM Corporation, Farmington, Conn.

Filed Apr. 1, 1982, Ser. No. 364,495

Int. Cl.³ D05B 65/06, 49/00

U.S. Cl. 112—262.1 14 Claims

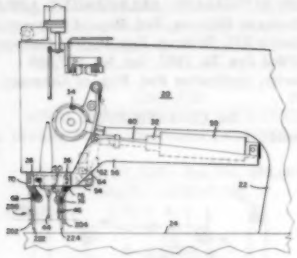
1. A thread wiping mechanism for a sewing machine having

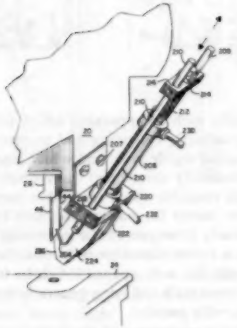
a plurality of shuttleable needles thereon, which wiping mechanism is employed to retract the threads of any needle which is inactive in said machine comprising:

a needle holder assembly slidably arranged on a sewing machine head;

a thread wiper arranged to remove any thread from any inactive needle out of the sewing path of any active needle.

10. A method of removing thread of an inactive needle from the sewing path of an active needle in a shuttleable multiple needle sewing machine comprising:





providing an actuatable reciprocable thread wiping mechanism adjacent the shuttleable needle mechanism on the sewing machine;

actuating said thread wiping mechanism so as to extend a wiping finger beneath its needle;

shuttling said shuttleable multiple needle mechanism in a support wherein a needle is shifted from an active position to an inactive position and a needle is shifted from an inactive position to an active position.

4,450,782

NEEDLEWORK FLOWER STITCH

Liliana Tortell, 3524 E. Avenue R, #113, Palmdale, Calif. 93550

Filed Jun. 24, 1983, Ser. No. 507,521
Int. Cl.³ D05B *97/00*
U.S. Cl. 112—266.1 **3 Claims**

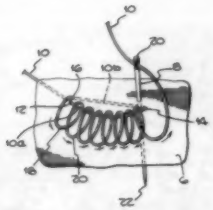
1. A method for forming a third dimensional scallop stitch which comprises:

forming one end of a bar of thread on a piece of cloth by passing a threaded needle through the cloth from the back of the cloth,

forming the other end of the bar by passing the threaded needle through the cloth from the front of the cloth a predetermined distance from said one end of said bar of thread,

providing a petal-like unit by forming loops about the bar of thread by passing the threaded needle repeadedly under and around the bar of thread and above said cloth whereby said loops are secured only to said bar of thread.

and continuing the formation of loops on the bar of thread until the portions of the loops immediately adjacent the bar of thread are confined between the end of said bar of thread in close relationship to each other,



free portions of said loops remote from said bar of thread being relatively unconfined and disposed generally along a line longer than that of said bar of thread,

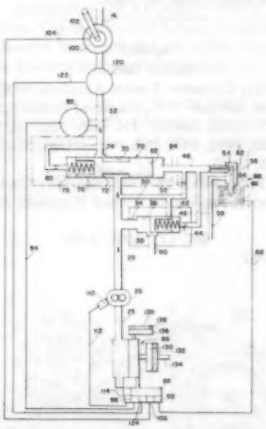
whereby the confined portions of the loop will cause the free loop portions of the petal-like unit to tend to stand away from the cloth carrying the bar of thread.

4,450,783

ELECTRONICALLY CONTROLLED FUEL PUMP

Corydon E. Morris, and Salim A. Jaliwala, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 30, 1982, Ser. No. 430,899
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—458 **7 Claims**



1. In a fuel system for an internal combustion engine having injectors which meter fuel to said engine as a direct function of fuel pressure, a fuel pump comprising,

pump means for pressurizing a source of fuel,

electronic control means for generating an electrical signal as a function of selected control inputs, and

means for regulating the output pressure of said pump means comprising,

means responsive to said electrical signal for establishing a control pressure,

means responsive to the control pressure for regulating the

supply pressure of said pump means to a predetermined level above the control pressure; and

means responsive to the control pressure for further regulating the regulated supply pressure to a predetermined output level below the control pressure, said fuel pump outlet pressure level being the level necessary for operation of the injectors,

whereby excessive pressurization of the pump output is minimized.

4,450,784

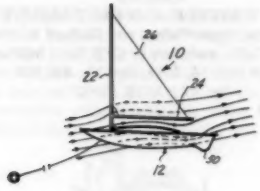
HAND-CARRYABLE FLYING SAILBOAT

Ellis Mellinger, Hermosa Beach, Calif., assignor to Llumar Star Kites, Pacoima, Calif.

Filed Feb. 16, 1982, Ser. No. 348,848

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—39 **31 Claims**



1. Hand-carryable flying sailboat for kite and water sports, comprising a rigid, lightweight frame, kite string and bridle attachment means carried by said frame, and including port and starboard hull members and fore and aft crossbars extending therebetween, sheet material supported by said frame in lifting surface-defining relation, and an upright sail assembly cooperating with said frame means to maintain a lifting surface shape in said sheet material; said frame, sail and sheet material being relatively proportioned in weight, shape and area such that the sailboat sails on water and flys in the air for use as a kite.

30. The combination of a hand-carryable flying sailboat bracket and kite dowels, said bracket retaining said dowels securably for flight, said bracket comprising a generally planar, triangular perimeter, molded plastic web formed by plural, apex-intersected, dissimilar size triangles, tubular sleeves defined by said triangles to be open-walled in the plane of the web, said dowels being received in passing relation by said sleeves beyond the plane of said web and a side edge margin-stiffening rib between said sleeve open wall and said web perimeter.

4,450,785

APPARATUS FOR COATING OBJECTS ELECTROSTATICALLY

Roland A. Meisner, Schorndorf, Fed. Rep. of Germany, assignor to BASF Farben +Fasern AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 234,193, Feb. 13, 1981, abandoned. This application Mar. 17, 1983, Ser. No. 474,275

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005678

Int. Cl.³ B05B *5/02*; B05C *5/02*

U.S. Cl. 118—626 **8 Claims**

1. In an apparatus for electrostatically coating an object using electrostatically charged powder grains, comprising:

(a) means for feeding an air-powder mixture to a spray bell having a spray head;

(b) means on said spray bell for fanning out the flow of said air-powder mixture;

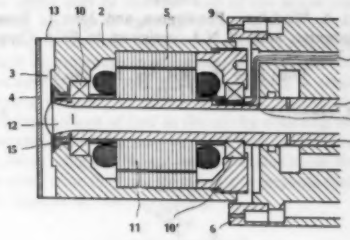
(c) means for centrifuging said powder grains off said spray head;

(d) means for applying an electric field between said spray bell and said object and

(e) means for conveying said powder grains onto said object to be treated;

the improvement comprising:

(f) a fixed hollow shaft (1) defining a central supply line for fluidized flow of said air-powder mixture and said means for feeding:



(g) said spray bell (2) adapted for rotation about said hollow shaft and sucking said fluidized flow;

(h) a plurality of first compressed air nozzles (7) passing radially into said hollow shaft for control of said fluidized flow; and

(i) further comprising a nozzle ring (6) having a plurality of second compressed air nozzles (9) positioned parallel to said hollow shaft and defining said means on said spray bell for fanning out.

4,450,786

GROOVED GAS GATE

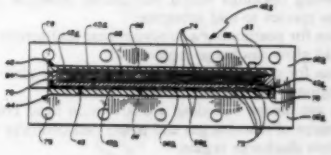
Joachim Doehler, Union Lake; David A. Gattuso, Pontiac, and Kevin R. Hoffman, Sterling Heights, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 407,983, Aug. 13, 1982, Pat. No. 4,438,724. This application Feb. 16, 1983, Ser. No. 466,995

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—719 **16 Claims**



1. In a gas gate which includes a relatively narrow passageway adapted to (1) operatively interconnect a pair of adjacent deposition chambers and (2) substantially reduce diffusion from the first of the pair of chambers to the second of the pair of chambers; means providing for the passage of substrate material from one of the pair of chambers wherein a first semiconductor layer is adapted to be deposited onto a surface thereof, and into the other of the pair of chambers wherein a second semiconductor layer is adapted to be deposited atop the first layer; means associated with at least the first and second chambers for maintaining preselected pressures therein; and means urging the unlayered surface of substrate material toward a passageway wall; the improvement comprising, in combination:

groove means formed in the passageway wall toward which the unlayered surface of substrate material is urged, said groove means being substantially coextensive with the length of the passageway so as to operatively interconnect

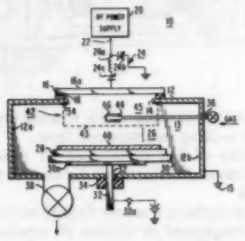
the adjacent chambers, whereby gas flow is established through the passageway slit defined by the space between the gas gate passageway wall having groove means formed therein and the unlayered surface of substrate material for substantially reducing diffusion from the first to the second of the chambers.

4,450,787

GLOW DISCHARGE PLASMA DEPOSITION OF THIN FILMS

Herbert A. Weakliem, Pennington, and John L. Vossen, Jr., Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1984, Ser. No. 386,686
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—723 **6 Claims**



1. In a plasma deposition reactor apparatus having a reaction chamber for depositing a thin film of material on a substrate surface from a reactive radio frequency (RF) glow discharge, comprising a cathode connected to an RF power supply, and an anode for establishing a glow discharge region, characterized by:

means for confining the RF field from said RF power supply to a region within said chamber comprising said cathode and said anode to confine thereby a glow discharge of a reactive gas in said region;

said confining means including a perforated screen electrically connected to said anode and positioned between said anode and said cathode to confine the glow discharge in the region between the cathode and the screen said screen having openings which will permit diffusion of reactive gas species to said substrate;

means for positioning a substrate near said screen but not in said glow discharge region; and

means for conducting reactive gas into the glow discharge region;

said gas means including a distribution head coupled to a source of reaction gas and positioned centrally within the glow discharge region.

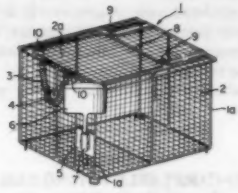
4,450,788

CAGE FOR REARING SMALL ANIMALS FOR EXPERIMENTS

Motohiro Niki, Tokyo-To, Japan

Filed May 20, 1982, Ser. No. 380,308
Claims priority, application Japan, May 30, 1981, 56-80092
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—18 **4 Claims**

1. In a cage for rearing small animals which has an access door and walls, the combination therewith of a water dispensing device comprising a mounting plate fixed to a wall to cover an opening in the wall and having a vertical elongated hole, a straight holding tube of uniform cross section inserted through the elongated hole and fixed to the mounting plate at the two longitudinal edges of the hole with an inclined orientation such that the holding tube extends obliquely upward outside the cage and obliquely downward inside the cage, and a water dispenser made up of a water container and a spout projecting from the container and terminating at a dispensing end, said spout being removable and slidably inserted from outside the



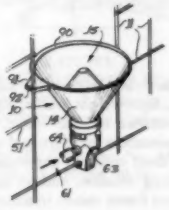
cage through the holding tube and held in mounted state with the dispensing end thereof projecting slightly beyond the lower end of the holding tube.

4,450,789

CUP WATERER AND CAGE MOUNT

Norman P. Nilsen, Apple Valley, and Richard T. Novey, Glendale, both of Calif., assignors to CTB, Inc., Milford, Ind.

Filed Feb. 14, 1983, Ser. No. 466,054
Int. Cl.³ A01K *39/02*
U.S. Cl. 119—18 **13 Claims**



1. A watering device for confined poultry, comprising, in combination, upwardly opening cup means, a hollow valve body extending at least partly into the cup means, the valve body having a lower end adapted for fluid communication with a supply of water, and an upper end defining a valve seat, a valve pin having a shank extending through the valve body upper end, and an enlarged pin head disposed inside the valve body and adapted for water-flow-inhibiting cooperation with the valve seat, but permitting water flow through the upper body end when the pin is moved so as to displace the pin head from the valve seat, mounting base means engaging the cup means and adapted to substantially surround a portion of at least one bar of a poultry confinement area, whereby to support the cup means, valve body means and mounting base means on the confinement bar, and the upwardly opening cup means including an upper lip, said upper lip defining at least one recess adapted to engage at least one bar defining said poultry confinement area, so as to mount said cup means and watering device in a position accessible to the confined poultry.

4,450,790

ANIMAL FEEDING APPARATUS

Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Adon Sanchez, Pomona, Calif.

Filed Sep. 30, 1982, Ser. No. 429,526
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51.12 **10 Claims**

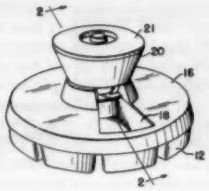
1. An automatic animal food dispenser comprising:

tray means having a plurality of food receptacles therein with upper openings of generally similar configurations;

a cover positioned over said tray and defining an aperture

sized and configured generally like said configuration of said receptacle openings, said cover being movable among a plurality of successive positions, in each of which positions said cover aperture is generally registered with one of said receptacle openings;

means for indexing said cover among said plurality of positions; and



means for selective delivery of a quantity of liquid to said receptacles including a reservoir having valve means, a support for holding said reservoir above said cover, and mechanical actuation means for releasing said quantity of liquid responsive to movement of said cover, said mechanical actuation means including valve actuating means attached to said cover for actuating said valve means.

4,450,791

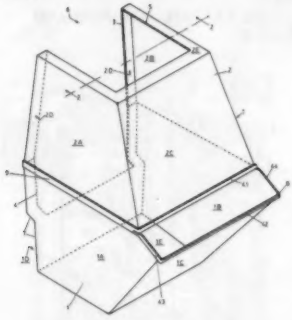
FEED TUB

Douglas V. Briggs, Jenness Pond Rd. East, Northwood, N.H. 03261

Continuation-in-part of Ser. No. 331,170, Dec. 16, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 505,194

Int. Cl.³ A01K *5/01*

U.S. Cl. 119—61 **7 Claims**



1. An animal feed tub adapted for use in combination with a tombstone fence and a pivot bar associated with the fence, said feed comprising:

A. a lower container portion having

(i) a front wall having means for engaging the pivot bar,

(ii) opposing side walls,

(iii) a rear wall having means for engaging the tombstone fence,

(iv) and a bottom;

B. an upper container portion having

(i) a front wall,

(ii) opposing side walls,

(iii) a rear wall,

(iv) and a top;

C. the front and side walls of the top portion forming a bottom edge which interlocks with a top edge of the front and side walls of the bottom portion;

D. the upper portion being sized to fit within the bottom portion when disassembled from the bottom portion and inverted;

E. the front wall of the lower container portion being tappered outwardly such that the upper edge of the front wall of the lower container portion, the portions of the upper edge of the side walls of the lower container portion adjacent to the front wall and the lower edge of the front wall of the upper container portion for an access opening; and

F. the upper part of the rear wall of the lower container portion having an opening which is contiguous to an opening in the rear wall of the upper container portion which is contiguous to an opening in the top of the upper container portion, said openings forming a single feed opening whereby an animal may feed through the feed opening, spillage of feed in the tub by a feeding animal is minimized, the tube may be filled with feed through the access opening and the tub may be rotated about the pivot bar away from the tombstone fence to dispense feed in the tub through the access opening.

4,450,792

DEVICE FOR ARRESTING THE HIND LEG OF AN ANIMAL

Werner Weiland, Bendorf, Fed. Rep. of Germany, assignor to Rheintechnik, Weiland & Kasper KG, Neunkichen, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 334,726

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 8101476

Int. Cl.³ A01K *15/00*; B68B *1/14*

U.S. Cl. 119—126 **3 Claims**

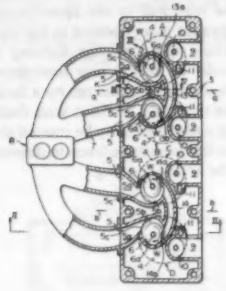
1. Device for arresting a hind leg of an animal, especially cattle, comprising: a ring-shaped part to be placed about the animal hind leg shortly above the leg-joint; a pressure-exerting part movable relative to the ring-shaped part and adapted to bear upon the leg's Achilles tendon; said ring-shaped part having an oval shape; said ring-shaped part comprising two articulately connected sections; a hinge connecting said sections at one side of said ring-shaped part; a snap-lock for uniting said sections at an opposite side of said ring-shaped part; said ring-shaped part being separated into said sections laterally of the hind leg to be arrested; one of said sections having a projecting spring-biased hook, and the other section having a slot provided with a bolt embraceable by said hook, said hook and slot comprising said snap-lock, the leg of the animal being captured against kicking from the instant that said snap-lock locks, so that danger to a user of the device is prevented.

4,450,793

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi, and Katsuhiko Motosugi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 10, 1980, Ser. No. 195,851
Claims priority, application Japan, Jan. 29, 1980, 55-8353
Int. Cl.³ F02B *75/18*
U.S. Cl. 123—52 MB **6 Claims**



1. An internal combustion engine having a cylinder head, at least two cylinders, each having a combustion chamber and an intake valve,

at least two intake port passages formed in the cylinder head and connected to the corresponding combustion chambers via the corresponding intake valves, each of said intake port passages comprising a port terminating portion having a circumferential wall formed around a valve stem of the corresponding intake valve and an inlet port portion having an opening which is open to said port terminating portion, and

a common connecting passage formed in the cylinder head and interconnecting said port terminating portions to each other, said common connecting passage having openings formed at opposite ends thereof, each opening being open to said corresponding port terminating portion at a position opposite to the opening of said corresponding inlet port portion with respect to the valve stem of the corresponding intake valve, wherein the improvement comprises:

the opening of said inlet port portion and the opening of said common connecting passage which are open to the same port terminating portion are oppositely tangentially connected to the circumferential wall of said same port terminating portion towards a same circumferential direction;

each of said inlet port portions has a minimum cross-sectional portion; and

said common connecting passage has a uniform rectangular cross-section over the entire length thereof, the cross-sectional area of which is 0.5 to 1.0 times the cross-sectional area of said minimum cross-sectional portion of the inlet port portion.

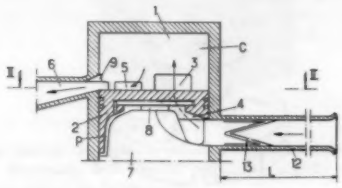
4,450,794

TWO STROKE ENGINE

Yves Pailler, Cieux, 87520 Oradour-sur-Glane, France

Filed Feb. 3, 1983, Ser. No. 463,506
Claims priority, application France, Feb. 3, 1982, 82 01685
Int. Cl.³ F02B *33/12*
U.S. Cl. 123—74 R **8 Claims**

1. A two-stroke engine comprising at least one cylinder (1) in which is slidingly mounted a piston (2) which defines in this cylinder a combustion chamber (C) and a precompression chamber (P), the cylindrical lateral wall of the cylinder being formed with at least two ports closable by the piston (2), namely at least one transfer port (3) through which opens a transfer channel (4) connecting the two chambers together and at least one exhaust port (5) communicating with an exhaust pipe (6), characterized in that these two ports (3,5) are arranged and disposed so that the opening of the transfer port (3)



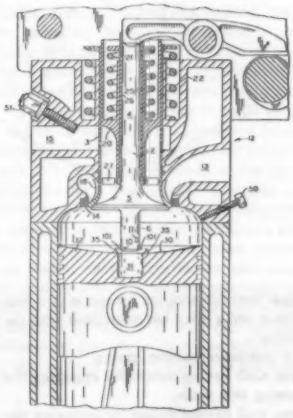
begins before that of the exhaust port (5) and in that special means are provided for making the pressure of the fresh gases admitted into the combustion chamber (C) through the transfer port (3), during opening of this transfer port, sufficiently high with respect to that of the burnt gases then present in the combustion chamber.

4,450,795

FOUR-STROKE PISTON ENGINE

Josef Schaich, 118 Oschle 7906, Markbronn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 957,661, Nov. 3, 1978, abandoned, Continuation-in-part of Ser. No. 854,904, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 643,165, Dec. 22, 1975, abandoned. This application Sep. 17, 1981, Ser. No. 302,993
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1974, 2461444
Int. Cl.³ F01L *1/28*; F02B *3/00*
U.S. Cl. 123—79 C **17 Claims**



1. A piston engine comprising: a cylinder having an internal wall, a cylinder head, a piston reciprocatingly received in said cylinder and defining a compression space in said cylinder, at least one ignition device disposed in said compression space, an outlet channel and an outlet valve, an inlet channel in said cylinder head communicating with the cylinder through an inlet port, an end portion of said inlet channel and said inlet port being substantially coaxial with said cylinder, an inlet valve disposed substantially coaxially with the longitudinal axis of said cylinder being received in said cylinder head and

closing said inlet port, means for imparting a helical rotating movement to the air unmixed with fuel around the longitudinal axis of the cylinder within said inlet channel during the intake of the air into the cylinder, the already helically flowing air flowing into the cylinder substantially turbulence free to form a cylinder of helically flowing air in the piston-swept and compression space, a nozzle carrier carried by said inlet valve being an end projecting beyond said inlet valve into the compression space, at least one nozzle means being provided on said nozzle carrier spaced inwardly of said inlet valve in said compression space and having an outlet aperture directed in a substantially outward direction relative to the longitudinal axis of the cylinder for injecting or blowing a jet of fuel into the cylinder of helically flowing air, the rotating air distintegrating the fuel jet to form a combustible air-fuel mixture surrounded by a rotating ring or cylinder of pure air and partially or completely flowing between said nozzle means and said inlet valve.

4,450,796

FOUR-STROKE PISTON ENGINE

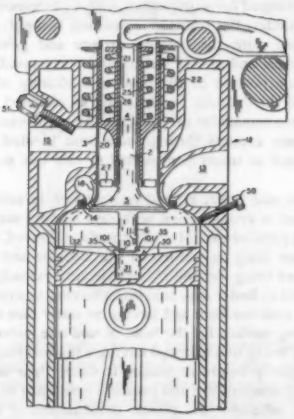
Josef Schaich, 118 Oschle 7906, Markbronn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 957,661, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 854,904, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 643,165, Dec. 22, 1975, abandoned. This application Nov. 6, 1981, Ser. No. 318,738

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1974, 2461444

Int. Cl.³ F01L *1/28*; F02B *3/00*

U.S. Cl. 123—79 C **16 Claims**



1. A piston engine comprising: a cylinder having an internal wall, a cylinder head, a piston reciprocatingly received in said cylinder and defining a compression space in said cylinder, an outlet channel and an outlet valve, an inlet channel in said cylinder head communicating with the cylinder through an inlet port, and end portion of said inlet channel and said inlet port being substantially coaxial with said cylinder, an inlet valve disposed substantially coaxially with the longitudinal axis of said cylinder being received in said cylinder head and closing said inlet port, a nozzle carrier carried by said inlet valve having an end projecting beyond said inlet valve and into the compression space and being temporarily received in a recess in the piston crown on part of its length, at least one nozzle means and one ignition device being provided on said nozzle carrier to form an ignitable mixture in the region of the longitudinal axis of said cylinder, and two spoons provided on the piston crown, said spoons being located opposite respective nozzles for forming the ignitable mixture at predetermined times.

4,450,797

CRANK DRIVE FOR DIESEL ENGINE

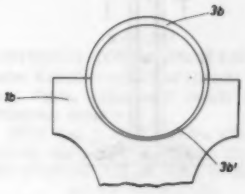
Franz Moser, and Tomas Visek, both of Steyr, Austria, assignors to Steyr-Daimler Puch Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 228,926, Jan. 27, 1981, abandoned. This application May 11, 1983, Ser. No. 492,548

Claims priority, application Austria, Jan. 30, 1980, 477/80

Int. Cl.³ F02B *75/04*

U.S. Cl. 123—78 F **2 Claims**



1. A crank drive for a reciprocating piston of a plurality of pistons of a diesel engine, comprising a crankshaft having a crank pin, a connecting rod having two opposite ends, the connecting rod ends having annular bearing surfaces defining bores respectively receiving the crank pin and a piston pin carried by the reciprocating piston, at least one of the annular bearing surfaces being comprised of two parts having end faces in contact with each other along a plane passing through the axis of the one annular bearing surface, and an annular eccentric bushing exchangeably positioned in the bore of the said annular bearing surface between one of the pins and the one bearing surface, the annular eccentric bushing being comprised of two parts having end faces in contact with each other in said plane, the two eccentric bushing parts being symmetrical with respect to a median plane perpendicular to said plane passing through the axis and being selectively rotatable together by 180° increments in a circumferential direction, the eccentric bushing parts being fixed in position in the bore after rotation whereby the bushing provides a fixed eccentric bearing for the one connecting rod end, and being exchangeable in the bore with an annular bushing of uniform wall thickness.

4,450,798

ENGINE INTAKE VALVE WITH HEAT PIPE

Alfred J. Jessel, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 221,488, Dec. 30, 1980, abandoned. This application Oct. 1, 1982, Ser. No. 432,193

Int. Cl.³ F01P *3/14*

U.S. Cl. 123—41.41 **3 Claims**

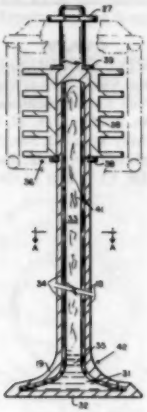
1. A method for reducing the tendency toward autoignition in an internal combustion engine without changing engine design, engine operating conditions or fuel composition comprising the steps of:

(a) passing the input fuel charge to the combustion chamber of said engine over a cooled intake valve;

(b) said intake valve being cooled by evaporating and condensing a coolant material contained within said valve;

(c) said coolant material having a liquid phase at ambient temperatures, said liquid phase being partially evaporated to a vapor at the temperature of the portion of said valve which is heated by said internal combustion process, and said vapor phase is condensed to liquid phase at the tem-

perature of lubricating materials in said internal combustion engine;



whereby the temperature of said input fuel charge is maintained.

4,450,799

VALVE CLEARANCE COMPENSATOR FOR INTERNAL COMBUSTION ENGINES

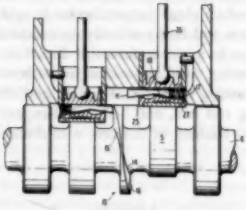
Karl Zeilinger, Berglen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,073

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932504

Int. Cl.³ F01L *1/22*

U.S. Cl. 123—90.53 **12 Claims**



1. A clearance compensator for respective valves of an internal combustion engine which includes a camshaft having a plurality of operating control cam means for operating the valves of the engine, each compensator including a sliding member provided with a wedge-shaped surface, said sliding member being arranged so as to be axially displaceable between each control cam means and an associated valve, a compression spring means for constantly urging the sliding member in a first direction, and an adjusting means intermittently acting upon the sliding member so as to urge the sliding member in a direction opposite said first direction, characterized in that the adjusting means is connected with the camshaft and is adapted to displace the sliding member against a force of the compression spring means when the associated valve is in a closed position and over a partial range of a closed period of the valve,

the adjusting means includes a disk adapted to be fixedly connected to the camshaft, said disk is provided with at least one cam means for axially displacing the sliding member, and a cup tappet is provided for each of the valves, and in that the sliding member is latitudinally movably guided in the respective cup tappets.

4,450,800

LIGHT METAL CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINE

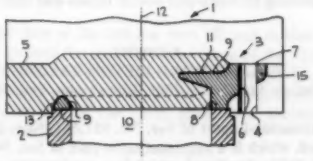
Walter Kotauschek, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,957

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047037

Int. Cl.³ F02F *3/04, 1/24*

U.S. Cl. 123—193 CH **7 Claims**



1. A cylinder head of light metal for connection by threaded fasteners with a cylinder of heavy metal of an internal combustion engine, the head having a predetermined temperature and pressure resistance to creep and having a plurality of bores evenly distributed over a circumference thereof and extending from an outer bearing surface, the head also having a sealing surface arranged for engagement with a corresponding surface of the cylinder, the fasteners extending through the bores in engagement with the bearing surface and generating high forces thereat and at said sealing and corresponding surfaces, at least one portion of the head in a vicinity of an exhaust passage of the cylinder head having an elevated temperature relative to a remainder of the head, the improvement wherein one fastener extends through one bore located in said one portion, and an insert is provided at said one portion of the head,

wherein said insert at said one portion is substantially T-shaped in cross-section with said bearing surface thereof lying parallel to said sealing surface thereof, said bearing surface lying in one leg of the T-shape and another leg thereof being defined by a projection extending toward a central cylinder axis, said insert having an opening coaxial with said one bore and having an outer face defining said bearing surface for the head of said one fastener, and said insert being of a material having a higher temperature and a higher pressure resistance to creep than said predetermined temperature and pressure resistance to creep of the head, whereby any plastic deformation of the cylinder head at said one portion, as caused by high forces, is substantially avoided.

4,450,801

WATER PRESSURE ACTIVATED OVERRIDE FOR CYLINDER DEACTIVATOR

Kevin J. Thedens, and Leslie A. Roettgen, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Nov. 16, 1981, Ser. No. 321,648

Int. Cl.³ F02B *77/08;* **F02D** *17/00*

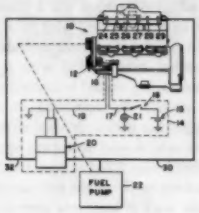
U.S. Cl. 123—198 F **10 Claims**

1. In a multicylinder, compression ignition engine having a pressurized liquid cooling system in which an engine driven coolant pump varies system pressure generally as a direct function of engine rpm, the improvement comprising:

a means for selectively deactivating at least a portion of the cylinders,

a solenoid responsive to the presence of an electrical signal for actuating said deactivating system,

an operator controlled switch for selectively supplying the electrical signal to said solenoid; and,



a control means maintainable in either of two states in response to engine coolant pressure, one of which state terminates the electrical signal to said deactivating means when coolant system pressure and therefore engine rpm is above a predetermined level, thereby overriding the function of the operator controlled switch.

4,450,802

INTERNAL COMBUSTION ENGINES AND ROTARY VOLUMETRIC COMPRESSORS

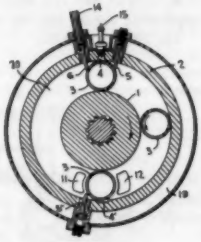
Agustin M. Parma, Luis Alberto De Herrana 2641, Montevideo, Uruguay

Division of Ser. No. 177,101, Aug. 11, 1980, Pat. No. 4,398,512. This application Mar. 10, 1983, Ser. No. 474,170

Claims priority, application Uruguay, Aug. 23, 1979, 20937

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—245 **1 Claim**



1. A rotary engine comprising a hollow cylindrical casing, end caps sealingly engaging the ends of the casing, a cylindrical rotor concentrically mounted within said casing in spaced relation thereto to provide an annulus, a drive shaft concentrically located on the rotor with its ends extending through the end caps, bearing means in the end caps for supporting the shaft for rotation, seal means between said end caps and shaft, three cylindrical rollers disposed within said annulus in rolling contact with the outer surface of the rotor and inner surface of the casing, two diametrically opposed slots in the inner surface of the casing, each slot having a width and depth sufficient to retain one of said rollers engaged therein from revolving in a circular path through said annulus until dislodged from said slot by a predetermined force, an intake and exhaust port communicating with said annulus on opposite sides of one of said slots, a spring urged pawl on the intake port side of said one slot for releasably retaining a roller in said one slot, a spark plug in the other slot, a second spring urged pawl on the side of said other slot nearest the exhaust port for releasably retaining a roller in said other slot, a third spring urged pawl on the side of said other slot nearest the intake port for releasably retaining a roller in said other slot, a flywheel mounted on said shaft, a fuel mixture supply means communicating with said intake port, an electric power circuit means for said spark plug, a distributor means responsive to the position of said third pawl for firing said spark plug in timed sequence to propel one of the three rollers in a circumferential path through the annulus thereby rotating said rotor as the other two rollers are each retained in said slots.

4,450,803

INTERNAL COMBUSTION ENGINE

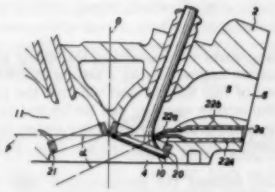
Yuzuru Namba; Kenichi Aoyagi, and Hiroshi Yokoyama, all of Hamamatsu, Japan, assignors to Suzuki Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 3, 1981, Ser. No. 289,700

Claims priority, application Japan, Aug. 13, 1980, 55-111351; Sep. 29, 1980, 55-135606; Sep. 29, 1980, 55-135607

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—308 **1 Claim**



1. In an internal combustion engine:

a combustion chamber defined by a cylinder, a cylinder head and a piston fitting in said cylinder;

a main suction path having a suction port formed in said cylinder head and adapted to be opened and closed by a suction valve at the open end portion of said suction port which is opened into said combustion chamber;

a sub-suction path, at least partially formed by a straight bore through the cylinder head, provided separately of said main suction path and having its outlet end opened immediately upstream of said suction path;

an exhaust port disposed opposite the suction port, and

an ignition plug disposed between the suction and exhaust ports, wherein a swirling direction of gas injection from said sub-suction path into said combustion chamber is directed such that a flow is toward the exhaust port after it has swept past the ignition plug;

wherein the improvement resides in that a direction in which the outlet end of said sub-suction path opens is within a range of about 30 degrees with respect to a plane extending normal to the axis of the cylinder, the plane including a line joining a point nearest on the wall of said cylinder from the ignition plug and the center of said sub-suction port; wherein the direction is also at angle of 15 to 30 degrees from a plane normal to the axis of the cylinder; and wherein an outlet end portion is a pipe, press-fitted into the bore in the cylinder head and having its leading end protruding into the suction port, the leading end being bent with respect to the bore in the cylinder head and the internal diameter of the leading end portion being of a reduced diameter with respect to the remainder of the pipe

wherein the outlet end portion is slightly laterally bent.

4,450,804

APPARATUS FOR INCREASING IDLING SPEED

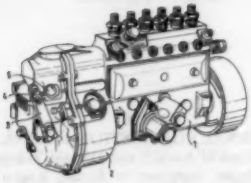
Wolfgang Sauerschell, Oberursel; Stephan Wietschorke, Schmitten, and Gerhard Ruschek, Hattersheim, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

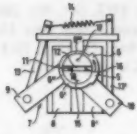
Filed Apr. 1, 1983, Ser. No. 481,306

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217351

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—366 **20 Claims**





1. In an arrangement for increasing the idling speed of an internal combustion engine having a setting member for controlling the feed of fuel thereto and wherein the path of displacement of the setting member can be limited in the idling direction by means of an idle stop and after a starting operation by a start-quantity stop, respectively, the improvement wherein

the means for limiting the displacement path includes a plurality of start-quantity stops arranged one behind the other in the idling direction, and

means for moving the start-quantity stop furthest from the idle stop out of the path displacement of the setting member beginning with the starting operation at predetermined time intervals one after the other respectively.

4,450,805

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

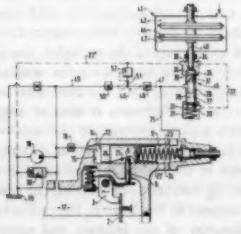
Franz Ehem, Stuttgart, and Gerald Höfer, Weissach-Flacht, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,947

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146499

Int. Cl.³ F02D *23/02, 1/06*

U.S. Cl. 123—387 **7 Claims**



1. A fuel-injection pump for internal combustion engines having a fuel quantity adjusting member arranged to traverse a travel and means associated therewith for varying said travel operable as an adjusting device, said adjusting device comprising an adjusting piston disposed in a cylinder, said piston being adjustable counter to a restoring spring, the travel of said quantity adjusting member being varied in accordance with movement of said adjusting piston via a transmission means, said adjusting piston being provided with two opposite extremities, a first of which defines with said cylinder a work chamber, said work chamber being filled with a fluid source of pressure, said pressure being varied in accordance with rpm of said fuel injection pump, characterized in that the second extremity of said adjusting piston defines with said cylinder a pressure chamber in which said restoring spring is disposed, said pressure chamber being filled with a fluid source of pressure and communicating with means for varying said pressure therein in accordance with at least one operating parameter of the engine and said pressure in said pressure chamber serves to supplement a force supplied by said restoring spring, whereby an adjusting force is applied to said adjusting piston.

4,450,806

INTAKE AIR THROTTLE DEVICE OF A DIESEL ENGINE

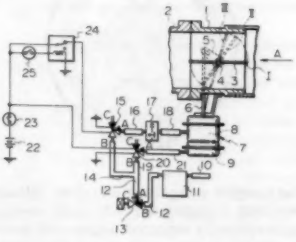
Nobuhiro Miura, and Kazushi Takahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 5, 1983, Ser. No. 455,736

Claims priority, application Japan, Jan. 18, 1982, 57-4837

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—401 **5 Claims**



1. An intake air throttle device of a diesel engine, comprising:

a throttle valve disposed in an intake air passage;

a vacuum-operated actuator for said throttle valve, said actuator being communicate with a vacuum source via a conduit means;

a means for controlling said actuator so that said throttle valve is brought into a full-open position when the engine runs at a load, into a full-closed position when the engine stops, and into an intermediate position between said full-open and closed positions when the engine runs at no load;

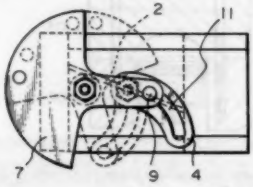
wherein the improvement is that a temperature sensitive valve is disposed in said conduit means so that said throttle valve is brought into said full-open position when the temperature of the engine coolant is below a predetermined value.

4,450,807

SUCTION AIR THROTTLING DEVICE OF DIESEL ENGINE

Takahiko Kinoshita, Aichi; Nobuhiko Kakeno, and Nobuhiro Miura, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 22, 1982, Ser. No. 452,134
Claims priority, application Japan, Feb. 3, 1982, 57-14750
Int. Cl.³ F02D 9/08
U.S. Cl. 123—403 2 Claims



1. A suction air throttling device of a diesel engine comprising a housing having a suction passage and comprising a throttle valve located in said suction passage and mounted on a rotary shaft supported in said housing, said throttle valve being connected with an accelerator pedal and opening said suction passage when an accelerator operates and shuts said suction passage when the accelerator does not operate, characterized in that there are arranged a first link, being fixed on the end of said rotary shaft on which said throttle valve is mounted and having an arc-shaped hole, and a second link, connected with the accelerator pedal via a wire and rotating around a shaft mounted on said housing eccentrically from said shaft on which said throttle valve is mounted and having a roller on the end thereof which slidably fits into said arc-shaped hole of the first link, said arc-shaped hole of the first link being shaped so that the opening degree of said throttle valve is larger in the small opening degree zone of the second link and the opening degree of said throttle valve is smaller in the large opening degree zone of the second link, whereby the characteristic curve between the opening degrees of said throttle valve and the accelerator is a convex line.

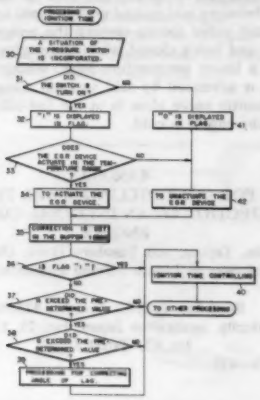
4,450,808

IGNITION TIMING CONTROL DEVICE

Eiichi Moriyama, and Nobuyuki Kobayashi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 23, 1982, Ser. No. 371,422
Claims priority, application Japan, Apr. 27, 1981, 56-63558
Int. Cl.³ F02P 5/04
U.S. Cl. 123—417 3 Claims

1. An ignition timing control device comprising:
crank angle detecting means for detecting a rotational speed of an engine to emit an engine rotational speed detection signal;
air flow metering means for detecting an intake air flow rate of said engine to emit an intake air flow rate detection signal;
pressure switch means for detecting the presence of an intake pressure above a preset value when an exhaust gas recirculation device operates;
igniter means for generating an ignition voltage and supplying said ignition voltage to said engine; and
electronic control means for taking in said engine rotational speed detection signal from said crank angle detecting means and said intake air flow rate detection signal from said air flow metering means, generating a control signal for controlling ignition timing based on said detection signals and data on ignition timing previously stored in an ignition timing calibration table, correcting said control signal related to said ignition timing to a predetermined value of lag angle on the basis of said engine rotational speed detection signal and said intake air flow rate detection signal when both said pressure switch means indicates said preset pressure is not exceeded and the value of ignition timing obtained from said ignition timing calibration table is within a predetermined region where said exhaust gas recirculation device would be actuated at low altitude, and controlling said igniter means in response to said corrected control signal.

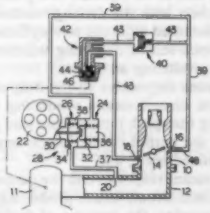


4,450,809

IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE

Hidemi Onaka, and Nobuki Uchitani, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 4, 1982, Ser. No. 405,036
Claims priority, application Japan, Apr. 28, 1982, 57-72169
Int. Cl.³ F02P 5/04; F02M 25/06
U.S. Cl. 123—421 10 Claims



1. An ignition timing control system for an internal-combustion engine wherein vacuum developed in an intake passage to the engine is applied to a vacuum advance unit connected to a distributor, said ignition timing control system comprising:
a throttle valve plate pivotally received within said intake passage;
a first port formed in the wall of said intake passage such that said first port is located upstream of said valve plate and exposed to the substantially atmospheric pressure while said valve plate remains in its idle position, said first port being exposed to said vacuum when said valve plate is opened from said idle position;
a second port formed in the wall of said intake pssage such that said second port is kept located downstream of said valve plate and exposed to said vacuum even when said valve plate is set to its fast-idle position, said second port

being exposed to the substantially atmospheric pressure when said valve plate is further opened from said fast-idle position;

connecting means for connecting said first and second ports with said vacuum advance unit; and

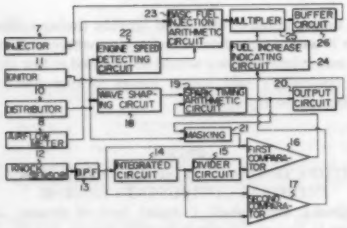
heat-sensitive valve means disposed in said connecting means between said second port and said vacuum advance unit, said valve means sensing the temperature of said engine and being closed when the engine is warmed up above a lower temperature limit, whereby the ignition timing is advanced by said vacuum advance unit when said throttle valve plate is in the fast-idle position even while the engine is cold.

4,450,810

DEVICE FOR CONTROLLING SPARK TIMING AND FUEL INJECTION OF AN INTERNAL COMBUSTION ENGINE

Hiroki Wada, Toyota, and Yasuhiro Ikuta, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 8, 1982, Ser. No. 415,993
Claims priority, application Japan, Jan. 21, 1982, 57-6856
Int. Cl.³ F02D *37/02*
U.S. Cl. 123—425 **5 Claims**



1. A device for controlling spark timing and fuel injection of an internal combustion engine, said device comprising:

an electronic control unit for controlling spark timing and the amount of fuel to be injected at a predetermined pattern in connection with the driving conditions;

a knock sensor mounted adjacent to a cylinder block of the engine, the knock sensor detecting whether an engine is knocking and producing an output;

a first circuit means responsive to the output of the knock sensor, the first circuit means producing a first control signal retarding the spark timing from said predetermined pattern when the output of the knock sensor is above a first predetermined level; and

a second circuit means responsive to the output of the knock sensor, the second circuit means producing a second control signal increasing the amount of fuel to be injected beyond said predetermined pattern when the output of the knock sensor is above a second predetermined level above said first predetermined level.

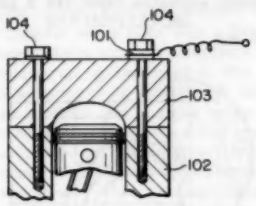
4,450,811

CONTROLLER FOR INTERNAL COMBUSTION ENGINE

Sadao Ichikawa, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Sep. 30, 1982, Ser. No. 430,225
Claims priority, application Japan, Oct. 8, 1981, 56-160822
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—425 **3 Claims**

1. A method for controlling the combustion in an internal combustion engine, comprising the steps of: sensing a crank angle of said engine corresponding to a time of maximum pressure in a combustion chamber of said engine; sensing a reference crank angle; providing a first ignition timing correcting signal when the sensed crank angle is delayed beyond said reference crank angle; sensing a knocking intensity; producing a second signal for correcting said ignition timing when said sensed knocking intensity exceeds a predetermined reference level; and effecting correction of said ignition timing in response to one of said first and second ignition timing correcting



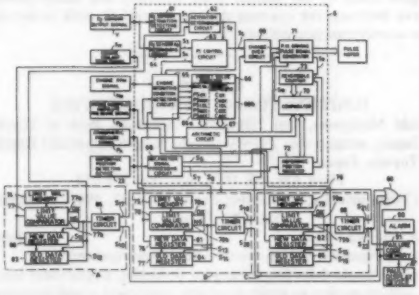
signal with said second ignition timing correcting signal having priority over said first ignition timing correcting signal, and wherein said step of correcting said ignition timing in accordance with one of said first and second ignition timing correcting signals comprises inhibiting said first ignition timing correcting signal for a predetermined time period in response to said second ignition timing correcting signal.

4,450,812

ELECTRIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING FAIL SAFE FUNCTION FOR ENGINE CONDITION DETECTING SENSORS

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,913
Claims priority, application Japan, Sep. 2, 1980, 55-122097
Int. Cl.³ F02M *7/12*
U.S. Cl. 123—438 **12 Claims**



1. An electric control system for controlling an internal combustion engine, which comprises: sensor means for detecting at least one of the operating conditions of said engine and an ambient condition in the vicinity of said engine to generate an output continuously variable with a change in said at least one condition; means operable in response to said output of said sensor means for controlling the operation of said engine; comparator means for comparing said output of said sensor means with an upper limit and a lower limit which are set at values lying slightly beyond a normal range of values indicative of said at least one condition which can exist during normal operation of said engine, said comparator means being adapted to generate a first signal when said output of said sensor means lies beyond said upper limit or said lower limit; and a timer arranged to generate a second signal when said first

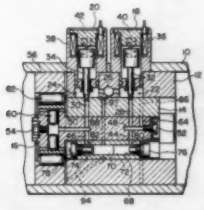
signal is continuously generated for a predetermined period of time, and means for causing an output of said sensor means which is generated substantially immediately before the generation of said first signal, to be used for control of the engine until said second signal is generated after the generation of said first signal.

4,450,813

DISTRIBUTION TYPE FUEL INJECTION PUMP

Yoshiya Takano, Katsuta, and Yoshikazu Hoshi, Tohkai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,558
Claims priority, application Japan, Aug. 28, 1981, 56-134117
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—450 **4 Claims**



1. A distribution type fuel injection pump for distributing and pumping a fuel into a plurality of cylinders of an internal combustion engine through discharge ports, comprising:

hydraulic head means formed therein with a cylindrical space and with first and second fuel feed ports;

rotor means having one portion thereof rotatably fitted in the cylindrical space of said hydraulic head means and formed with first and second inlet ports which are arranged radially to correspond to said first and second fuel feed ports and which are provided in an equal number to that of the engine cylinders;

cam ring means formed therein with a space, in which another portion of said rotor means is rotatably fitted through at least one pair of plungers disposed therein in an end-to-end facing relationship, said plungers being operative to effect the pumping action in accordance with a rotation of said rotor means;

first and second electromagnetic valve means for electrically controlling the opening and closing operations of said first and second fuel feed ports; and

pressure space means made separate from said rotor means and having an internal chamber which is partitioned into first and second pressure chambers by a shuttle slidable therein,

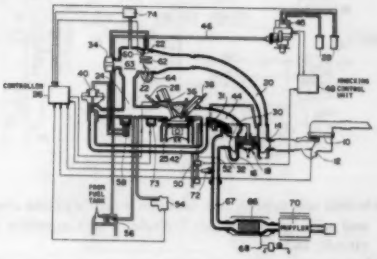
wherein the fuel, which has been introduced through said first fuel feed port and compressed by said plungers, is guided into the first pressure chamber of said pressure space means in accordance with the rotation of said rotor means, and wherein the fuel which has been introduced into said second pressure chamber is consecutively distributed and pumped into the respective cylinders of said engine through said discharge ports by the movement of said shuttle.

4,450,814

AIR-FUEL RATIO CONTROL APPARATUS AND METHOD FOR AN INTERNAL COMBUSTION ENGINE WITH A TURBOCHARGER

Kunifumi Sawamoto; Tatsuo Morita; Kenji Ikeura, and Hiroshi Yamaguchi, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 12, 1982, Ser. No. 357,646
Claims priority, application Japan, Mar. 13, 1981, 56-36062
Int. Cl.³ F02D *5/02*; F02B *3/00*
U.S. Cl. 123—478 **3 Claims**



1. An air-fuel ratio control apparatus for an internal combustion engine having a turbocharger disposed in an air intake passageway to the engine for urging compressed air to an intake passageway to said engine, an intake relief valve for venting part of the compressed air to the atmosphere in response to the compressed air pressure exceeding a predetermined value, and a fuel injector for injecting fuel into said engine, said air-fuel ratio control apparatus comprising:

(a) an air flowmeter for sensing the intake air flow to said engine and outputting a signal indicative thereof;

(b) means for sensing engine speed and outputting a signal indicative thereof;

(c) means for detecting whether said intake relief valve is open; and

(d) means for controlling the duration for which said fuel injector is opened to cause fuel to be injected therethrough into said engine in accordance with both the outputs of said air flowmeter and said engine speed sensing means when said detecting means does not detect that said intake relief valve is open, and solely in accordance with the output of said sensing means when said detecting means detects that said intake relief valve is open.

4,450,815

INTERNAL COMBUSTION ENGINE CONTROL APPARATUS

Yasunori Mouri, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,872
Claims priority, application Japan, May 6, 1981, 56-66952
Int. Cl.³ F02D *37/02*
U.S. Cl. 123—479 **13 Claims**

1. An internal combustion engine control apparatus comprising:

sensors including first sensor means for sensing analog operation parameters of an internal combustion engine and second sensor means for sensing digital operation parameters of said internal combustion engine;

a control unit for generating at least one control signal to control the operation of said internal combustion engine based on said operation parameters sensed by said sensors;

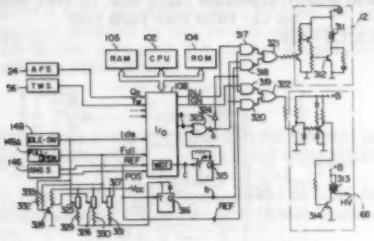
a control circuit for controlling the operation of said internal combustion engine by said control signal;

means for detecting failure of at least one of said first sensor means and said control unit; and

signal generating means responsive to the detection of the

failure by said failure detection means for generating one of a plurality of predetermined signals indicating a predetermined operation condition in accordance with the signals sensed by said second sensor means and supplying said one predetermined signal to said control circuit,

wherein said second sensor means includes an idle switch and a full-open switch,



wherein said control unit includes a fuel injection controller and said control circuit includes a fuel injection control circuit, and

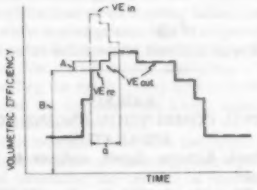
wherein said signal generating means generates one of three predetermined signals corresponding to three states derived from combinations of the output of said idle switch and the output of said full-open switch in accordance with the combination of the outputs of said idle switch and said full-open switch.

4,450,816

METHOD AND APPARATUS FOR CONTROLLING THE FUEL INJECTION AMOUNT OF AN INTERNAL COMBUSTION ENGINE

Toshiyuki Takimoto, Susono, and Takehisa Yaegashi, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 23, 1981, Ser. No. 333,775
Claims priority, application Japan, Dec. 23, 1980, 55/181212
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—492 **5 Claims**



1. An apparatus for controlling the amount of fuel injected into an internal combustion engine, comprising:

means for detecting the flow rate of intake air sucked into the engine to produce a first electrical signal which indicates the detected flow rate;

means for detecting the rotational speed of the engine to produce a second electrical signal which indicates the detected rotational speed;

processing means for (1) calculating, in response to said first and second electrical signals, the volumetric efficiency of the engine, (2) discriminating whether or not said calculated volumetric efficiency is equal to or greater than an upper setting value, and (3) restricting the changing rate of said calculated volumetric efficiency with respect to time within a limit rate, said restriction being executed only when it is discriminated that said calculated volumetric efficiency is equal to or greater than an upper setting value; and

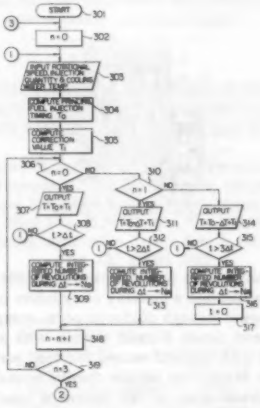
means for adjusting, in response to said calculated or restricted volumetric efficiency, the amount of fuel to be injected into the engine.

4,450,817

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION TIMING FOR COMPRESSION IGNITION ENGINES

Noritaka Ibuki, Ogaki, and Shizuo Kawai, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 12, 1982, Ser. No. 357,618
Claims priority, application Japan, Mar. 19, 1981, 56-40597
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—501 **6 Claims**



1. A method for controlling the fuel injection timing of a compression ignition engine comprising the steps of:

selecting three fuel injection timings comprising a calculated fuel injection timing determined in accordance with operating conditions of said engine and an advanced fuel injection timing and a retarded fuel injection timing which are respectively advanced and retarded from the calculated fuel injection timing by a predetermined dithering amount of fuel injection timing;

operating said engine alternately at the three selected fuel injection timings each thereof during a predetermined dithering period;

comparing with one another values of an engine operating parameter related to engine rotational speeds detected when said engine is operated at the three selected fuel injection timings and deciding from the results of the comparison whether the calculated fuel injection timing is advanced or retarded from an optimum fuel injection timing, and, when the decision from the results of the comparison is impossible, deciding whether said engine is accelerating or decelerating; and

correcting the calculated fuel injection timing in accordance with said decision from the results of the comparison, but inhibiting the correction when it is decided that said engine is accelerating or decelerating.

4,450,818

HYDRAULIC INJECTION-ADJUSTING DEVICE FOR HIGH PRESSURE INJECTION INSTALLATIONS IN AUTO-IGNITING INTERNAL COMBUSTION ENGINES

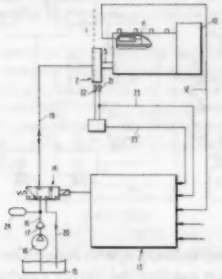
Frank Thoma; Karl-Heinz Hoffmann, both of Stuttgart, and Christoph Burckhardt, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,074

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932672

Int. Cl.³ F16D 5/00; F02M 59/20

U.S. Cl. 123—502 3 Claims



1. A hydraulic injection-adjusting device for high-pressure injection installations in autoigniting internal combustion engines, the injection-adjusting device including a plurality of operating chambers adapted to be supplied with a pressure medium, an electrically actuatable regulating valve means for controlling a supply of pressure medium from a pressure supply pump means to the operating chambers, means for sensing a plurality of current operating parameters of the engine and for providing an output signal of the sensed operating parameters, means for measuring an actual value of an adjustment angle of the injection-adjusting device and for providing an output signal of the actual value, and electronic control means for receiving signals from said sensing means and for providing an output signal of a desired adjustment angle of the injection adjusting device to the regulating valve means to control a positioning thereof, characterized in that the control means is operable to yield a first signal of a defined magnitude when the desired adjustment angle is larger than the actual adjustment angle and a second signal when the actual adjustment angle is larger than the desired adjustment angle, said regulating valve means is an electromagnetically operated three-position valve means, said valve means is responsive to the first signal of the control means and is displaced to a first position so as to supply pressure medium to the operating chambers and responsive to the second signal so as to be displaced to a second position so as to relieve the operating chambers of the pressure medium and in that a pressure medium reservoir means is interposed between the regulating valve means and the pressure supply pump means are facilitating a cold-starting of the engine,

means for providing for maintaining the regulating valve in a third closed position when the actual value and desired value coincide,

the injection-adjusting device further includes a housing directly driven by the crankshaft of the engine, an injection timer shaft adapted to be driven through said injection-adjusting device by the crankshaft of the engine, and a rotary disk means fixedly joined to the injection timer shaft and two operating chambers are disposed oppositely one another between the rotary disk means and the housing,

the injection-adjusting device further includes two oppositely disposed spring chamber means within the housing for accommodating injection timer springs,

the regulating valve means is disposed in the injection timer shaft.

4,450,819

DEVICE FOR ADJUSTING INJECTION TIMING OF A DISTRIBUTION-TYPE FUEL INJECTION PUMP

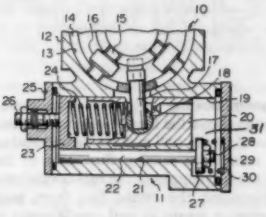
Yasuhiro Furuhashi; Naozi Ishikawa, and Shizuo Kawai, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 11, 1982, Ser. No. 377,175

Claims priority, application Japan, May 15, 1981, 56-69195[U]

Int. Cl.³ F02M 59/20

U.S. Cl. 123—502 3 Claims



1. A device adjusting the injection timing of a distribution-type fuel injection pump having a housing comprising:

a roller ring rotatably supported in a circular cavity that is formed in the housing of said fuel injection pump;

rollers which are rotatably supported by said roller ring via pins;

a shaft which is supported by said roller ring and which protrudes outwardly radially of said roller ring;

an adjusting piston which is coupled to said shaft and which slides in a first cylinder being urged by the fuel pressure; and

a timer spring which urges said adjusting piston so that said adjusting piston is moved responsive to the fuel pressure and the resilient force of said timer spring, and said roller ring is turned following movement of said adjusting piston, the improvement comprising:

a second cylinder parallel to and offset axially from said first cylinder,

a rod slidable in said second cylinder,

end members on both ends of said rod, said timer spring being inserted between one of said end members and an end of said adjusting piston such that the other end of said adjusting piston comes into contact with the other of said end members, and

an adjusting screw, which is screwed from the outer side of said housing, engaged with said one end member.

4,450,820

ENGINE FUEL CONDITIONER AND MONITOR

Hendrick W. Haynes, P.O. Box 66152 (250 SW. 176th St.), Seattle, Wash. 98166

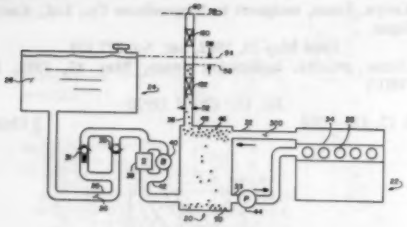
Continuation-in-part of Ser. No. 266,942, May 26, 1981, abandoned, which is a continuation of Ser. No. 50,198, Jun. 20, 1979, abandoned. This application Apr. 12, 1982, Ser. No. 367,378

Int. Cl.³ F02M 37/20

U.S. Cl. 123—514 16 Claims

1. A system for degassing and temperature balancing of cool intake fuel and heated, non-combusted fuel returning from fuel injector means of a diesel engine, the heated fuel being aerated by combustion gases from the engine, said system comprising a fuel line through which fuel passes to said fuel injector means, a fuel return line through which fuel passes from said fuel injector means, a fuel supply, fuel conditioning means having a

fuel reservoir and fuel intake and output ports, respectively communicating with the fuel supply and the fuel line for passing all fuel from the supply to the engine through the reservoir, fuel return port means connected to the fuel return line for returning the heated and aerated fuel from the engine to the fuel conditioning means, degassing column means having a



lower end communicating with the fuel reservoir and an upper open end spaced above the fuel conditioning means for venting gases in the cool intake fuel and the heated and aerated fuel to atmosphere, means for sensing flow rate of the intake fuel passing from the fuel supply to the fuel conditioning means and means for bypassing the intake fuel from said fuel supply around said sensing means to said conditioning means.

4,450,821

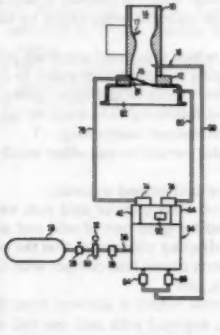
GASEOUS FUEL DELIVERY SYSTEM

Scott Venning, Mt. Prospect, Ill., and Dennis Discount, Jericho, N.Y., assignors to VCD Fuel Systems, Mt. Prospect, Ill.

Filed Sep. 13, 1982, Ser. No. 417,629

Int. Cl.³ F02M *13/08*

U.S. Cl. 123—525 **20 Claims**



1. A gaseous fuel delivery system as for an internal combustion engine normally operable on liquid fuel, the combination comprising:

a. idle delivery means responsive to engine operating conditions to supply gaseous fuel to said engine when said engine is operating at idle;

b. acceleration delivery means responsive to engine operating conditions to supply gaseous fuel to said engine when said engine is accelerating;

c. conduit means communicating said idle and acceleration delivery means to a source of gaseous fuel and to said engine

wherein said system includes:

a. means responsive to ported vacuum created by flow of air into said engine to open and close said idle delivery means; said means opening said idle delivery means when said engine is at idle and closing said idle delivery means when said engine is operating at other than idle;

b. means responsive to the vacuum in the intake manifold of said engine to open and close said acceleration delivery means.

4,450,822

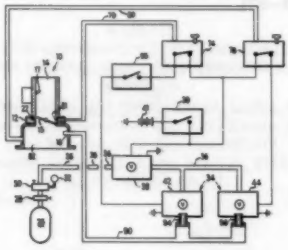
GASEOUS FUEL DELIVERY SYSTEM

Scott J. Venning, 617 S. Busse Rd., Mt. Prospect, Ill. 60056

Filed Sep. 13, 1982, Ser. No. 417,630

Int. Cl.³ F02M *13/08*

U.S. Cl. 123—525 **32 Claims**



1. A gaseous fuel delivery system for an internal combustion engine operable on gasoline and having a carburetor to supply gasoline thereto, said carburetor being arranged to supply gasoline only at other than idle conditions, the combination comprising:

(a) idle delivery means responsive to engine operating conditions to supply gaseous fuel to said engine when said engine is operating at idle;

(b) conduit means communicating said idle delivery means to a source of gaseous fuel and to said engine;

wherein said system includes means responsive to ported vacuum of a port in the carburetor throat to open and close said idle delivery means, said system including means communicating said port and said idle delivery means, said means responsive to ported vacuum opening said idle delivery means when said engine is operating at idle and closing said idle delivery means when said engine is operating at other than idle.

4,450,823

FUEL EVAPORATOR FOR INTERNAL COMBUSTION ENGINE

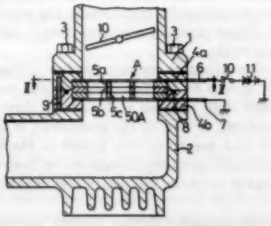
Seiko Abe, Okazaki; Toshihiko Igashira, and Kazuhide Watanabe, both of Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 4, 1983, Ser. No. 491,644

Claims priority, application Japan, May 4, 1982, 57-65449

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **7 Claims**



1. A fuel evaporator for heating fuel in an air-fuel mixture to

be supplied to an engine so as to promote the evaporation of fuel, comprising:

a heater means which is disposed in an air-fuel mixture passage of said engine so as to cross said passage; said heater means being composed of a plurality and an odd number of stacked ceramic plates, each of which has a plurality of open holes directing in the axial direction of said passage and communicating with open holes of adjacent ceramic plates, and electrodes which are provided on the upstream end surface and the downstream end surface of said stacked ceramic plates and between the opposed surfaces of adjacent ceramic plates; every other electrodes being connected to form two groups of electrodes;

a first group of electrodes being connected to a positive pole of an electric source while a second group of electrodes being connected to a negative pole of said electric source; and

a supporting member for supporting said heater means; said supporting member being formed of thermally and electrically insulating material into an annular body, of which the outer peripheral portion is fixed to the wall defining said air-fuel passage of said engine, and the inner peripheral portion retains the outer peripheral portion of said heater means.

4,450,824

EXHAUST GAS RECIRCULATION CONTROL SYSTEM WITH ATMOSPHERIC PRESSURE COMPENSATION VALVE

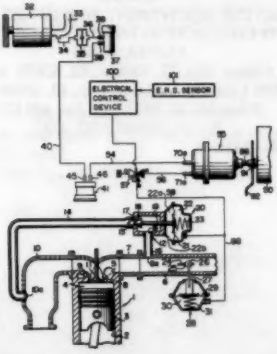
Ken Ando; Masaaki Tanaka, and Michio Kawagoe, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1982, Ser. No. 429,238

Claims priority, application Japan, Jun. 15, 1982, 57-103169

Int. Cl.³ F02M *25/06, 23/00*

U.S. Cl. 123—569 **10 Claims**



1. For a diesel internal combustion engine for a vehicle, comprising an air intake passage, an exhaust passage, and an exhaust gas recirculation passage whose upstream end is communicated to an intermediate point of said exhaust passage and whose downstream end is communicated to an intermediate point of said air intake passage:

an exhaust gas recirculation control system, comprising:

(a) a source of operating air pressure;

(b) an atmospheric pressure compensation valve, comprising an operating air pressure intake port and an operating air pressure output port, which receives a supply of said operating air pressure at its said operating air pressure intake port, and selectively bleeds atmospheric air into said supply of intake operating air pressure so as to produce a supply of atmospheric pressure compensated operating air pressure at its said operating air pressure output port, the amount by which the pressure value of said atmospheric pressure compensated output operating air pressure is deviated from the current value of atmospheric pressure diminishing as the absolute value of atmospheric pressure diminishes;

(c) an operating air pressure control valve, comprising an operating air pressure intake port and an operating air pressure output port, which receives a supply of said atmospheric pressure compensated operating air pressure from said operating air pressure output port of said atmospheric pressure compensation valve at its said operating air pressure intake port, and which selectively bleeds atmospheric air into said supply of atmospheric pressure compensated operating air pressure according to the value of the load on said diesel internal combustion engine so as to produce a supply of control operating air pressure at its said operating air pressure output port; the deviation from the current value of atmospheric pressure of said control operating air pressure either being equal to a target depression value which is determined according to said load on said diesel internal combustion engine, or being equal to the deviation value of said supply of atmospheric pressure compensated operating air pressure from said operating air pressure output port of said atmospheric pressure compensation valve, whichever is the less; and

(d) an operating air pressure operated exhaust gas recirculation control valve comprising an operating air pressure intake port, which receives a supply of said control operating air pressure from said operating air pressure output port of said operating air pressure control valve at its said operating air pressure intake port, and which controls the flow resistance of said exhaust gas recirculation passage according to the difference between the current value of atmospheric pressure and the current pressure value of said control operating air pressure supplied to its said operating air pressure intake port, so as to decrease said flow resistance from a maximum substantially infinite value such as to allow exhaust gas recirculation when the deviation from the current value of atmospheric pressure of said control operating air pressure increases beyond a certain predetermined value.

4,450,825

EGR CONTROL SYSTEM FOR DIESEL ENGINE

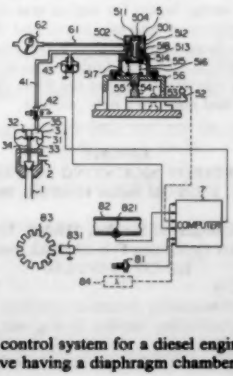
Kiyonori Sekiguchi, Aichi; Toshihiko Igashira, Toyokawa; Takeshi Tanaka, and Hisasi Kawai, both of Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 28, 1982, Ser. No. 454,099

Claims priority, application Japan, Dec. 28, 1981, 56-209793; Feb. 10, 1982, 57-18896

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **10 Claims**



1. An EGR control system for a diesel engine, comprising:

an EGR valve having a diaphragm chamber;

a pressure supply means for supplying negative pressure;

a regulating valve means, having an input path connected to said pressure supply means, an input path connected to the atmosphere and an output path connected to said diaphragm chamber of said EGR valve, for changing the areas of said input paths to regulate the negative pressure in said diaphragm chamber in response to an EGR rate signal;

sensors for sensing a plurality of engine running conditions of said engine;

means, responsive to one of the oxygen concentration in the exhaust gases and both the absolute pressure in an air intake pipe and the fuel amount, for generating an excessive air rate λ signal related to the ratio of the intake air amount to the fuel amount multiplied by the stoichiometric air-fuel ratio; and

computing means, responsive to signals from said sensors and said detecting means, for controlling said regulating valve means to adjust the pressure of said diaphragm chamber of said EGR valve by generating said EGR rate signal in accordance with said engine running conditions and feedback corrected by said excessive air rate λ signal from said generating means.

4,450,826

TOOL FOR TRUING UP GRINDING WHEELS

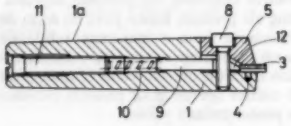
Jean-Claude Remy, Le Locle, Switzerland, assignor to Dixi S.A. Usine 4, Le Locle, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,470

Claims priority, application Switzerland, Jun. 2, 1981, 3595/81

Int. Cl.³ B24B *53/12*

U.S. Cl. 125—11 N **8 Claims**



1. A tool for truing-up grinding wheels comprising an elongate body having at one end a bearing surface for supporting an insert, an insert of regular polygonal configuration made at least partially of very hard material and having a plurality of cutting edges supported on said bearing surface, pivot means perpendicular to said bearing surface and coincident with the center of said insert about which said insert is rotatable to bring one or another of said cutting edges into an operative position, means for clamping said insert against said bearing surface and means for automatically positioning said insert angularly, said positioning means comprising an element slidable axially of said body and spring means for urging said slidable element axially into engagement with said insert, said slidable element having edge surfaces engageable with said insert to position said insert angularly with one cutting edge in operative postion, and being retractable against the force of the spring to permit turning said insert to a new position.

4,450,827

ANDIRON MOUNTING SYSTEM

Samuel D. Love, 13520 Old Indian Head Rd., Brandywine, Md. 20613

Continuation-in-part of Ser. No. 274,268, Jun. 16, 1981, abandoned. This application Feb. 23, 1982, Ser. No. 351,368

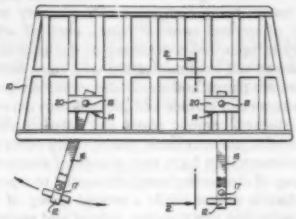
Int. Cl.³ F24B *13/00*

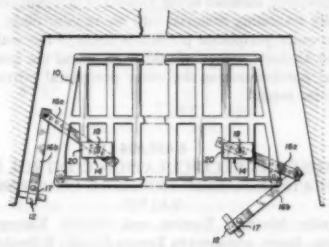
U.S. Cl. 126—298 **16 Claims**

1. An andiron mounting system, comprising:

an elongate connecting member having one end attachable to an andiron;

an attachment member for securing the other end of said connecting member to a fireplace grate at any one of a plurality of positions on said grate; and





means for allowing said connecting member to swivel in relation to the fireplace grate.

4,450,828

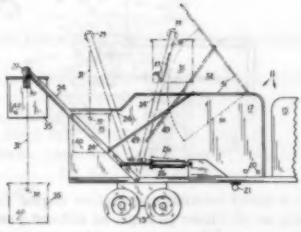
TRUCK HAVING EQUIPMENT FOR ON-SITE HEATING AND COLLECTING USED GREASE FROM CONTAINERS

Donald R. Onken, Box 72, Easton, Ill. 62633, and Robert L. Griffin, 509 Laurel Dr., Mason City, Ill. 62664

Filed Jul. 20, 1982, Ser. No. 400,123

Int. Cl.³ B60H *1/02, 1/22*

U.S. Cl. 126—343.5 A **5 Claims**



1. A waste grease truck for on-site dump-collecting used, deep-fry grease dumped into a large vat-like grease container which comprises:

a chassis;

a large tank secured on said chassis,

said tank including a large chamber having an openable top thereon for receiving grease dumped into said vat-like grease container and a small open-top chamber separated from said large chamber by a transverse partition,

said small open-top chamber being larger than said vat-like grease container and adapted to receive water therein and for receiving and heating said vat-like grease container to

loosen grease therein to enable pouring the grease therefrom into said large container chamber,

means in said small chamber for heating water received therein to form a hot water bath,

said large chamber including heating means therein for heating contents therein to facilitate drainage,

a parallel pair of arms each pivotally secured at one end to said chassis on opposite sides of said large tank with each arm of said pair having a free end,

a winch bar rigidly interconnecting, and journaled in, said free ends of said arms,

said winch bar having winch spools affixed to its ends adjacent said arms,

a reversible hydraulic motor for rotating said winch bar in opposite directions,

cable-like elements coordinately windable on each of said winch spools for lifting and lowering said large vat-like grease container relative to said arms,

coordinated hydraulic cylinders secured at one end to said chassis and at their opposite ends to said arms so as to swing a vat-like grease container supported by said arms to a desired position relative to said large tank,

said openable top of said large chamber being operatively connected to said arms for automatic opening and closing in response to movement of said arms by said hydraulic cylinders, and

means on said vat-like grease container and on said parallel arms which cooperate to dump the contents of said vat-like grease container into said large chamber,

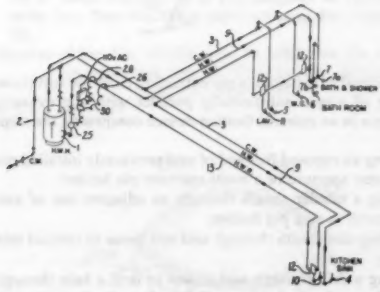
whereby said cable-like element ends are connected to opposite sides of said vat-like grease container for lifting said vat-like grease container, said arms are moved so that said vat-like grease container can be lowered into said small open top chamber in which the grease in said vat-like container is partially melted, then the vat-like grease container is lifted and the arms moved to a position so that the grease can be dumped into said large chamber by movement of the arms and tilting of the vat-like grease container by said means on said container and said arms that cooperate to dump the contents of said vat-like grease container.

4,450,829

WATER SAVING SYSTEM

Deen I. Morita, and Mark K. Morita, both of 1658 Auiki St., Honolulu, Hi. 96819

Filed Sep. 29, 1982, Ser. No. 426,272
Int. Cl.³ F24H *1/00*
U.S. Cl. 126—362 **10 Claims**



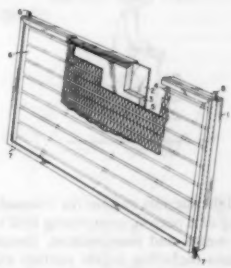
1. A water saving system comprising a water heater having a supply inlet connected with a water supply, a hot water supply outlet and a return inlet, an outlet valve at a location where hot water is to be used, a control unit adjacent said outlet valve and having an inlet, a supply outlet connected with said outlet, a return outlet and a normally closed control valve between said inlet and said supply outlet, a first line connecting the supply outlet of said heater with the inlet of said control unit, a second line connecting the return outlet of said control unit with the return inlet of said heater, said first and second lines together with said heaters and control unit forming a closed circuit, energizable means for circulating water in said circuit to return water from said control unit to said heater, means for energizing said circulating means when said outlet valve is opened and the temperature of water in said control unit is below a predetermined value, to circulate water in said circuit and thereby bring hot water from said heater to said control unit, means for opening said control valve when the temperature of water in said control unit reaches a predetermined value to supply hot water to said outlet valve and means for deenergizing said circulating means when the temperature of water in said circuit reaches a predetermined value.

4,450,830

SOLAR HEAT DEVICE

Rolf E. Hedman, and Gunnar Hedman, both of Lofsbergsvagen 36, S-582 69 Linkoping, Sweden

Filed Apr. 20, 1981, Ser. No. 255,969
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—450 **6 Claims**



1. A solar heat device to transfer heat energy from the sun to a fluid, preferably water, said solar heat device comprising a frame having an isolated bottom attached thereto, plural heat absorbing wafers having tubes for the fluid, and a sheet of glass disposed on top of the solar heat device, the frame comprising two portions, one said portion having a groove and the other portion having a substantially L-shaped profile, the one said portion and the other portion being arranged to be mounted to each other by means of a snapping mechanism, comprising a protruding edge and a flange of the one said portion as well as a corresponding recess and a furrows of the other L-shaped portion.

4,450,831

SELF SUPPORTING MOUTH SPECULUM FOR HORSES, MULES, AND OTHER ANIMALS

Louis D. Jeffrey, 14805 Branched Oak Rd., Waverly, Nebr. 68462

Filed Feb. 2, 1982, Ser. No. 345,138
Int. Cl.³ A61D *15/00*
U.S. Cl. 128—14 **1 Claim**

1. A self-supporting mouth speculum for horses and the like, comprising,

a first U-shaped cheek hook portion for insertion into one corner of the horse's mouth,

a second U-shaped hook portion for insertion into the other corner of the horse's mouth, said second U-shaped hook portion having a spreader portion thereon which is adapted to be positioned between the upper and lower rear molars of the horse's teeth when said second U-shaped hook portion is inserted into the horse's mouth,

and an adjustable strap means secured to and extending between said first and second cheek hook portions for

extension around the horse's head to maintain said cheek hook portion in position.

4,450,832

BODY WEIGHT SUPPORT SYSTEM

Thomas P. Waddell, 1306 Broadview W., Downingtown, Pa. 19335

Filed Aug. 25, 1982, Ser. No. 411,404
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 G **27 Claims**

1. A body weight support system for releasable securement to at least one leg of a person, comprising first support means, second support means and non-resilient, flexure means, said first support means including a first portion extending along the thigh, said first support means terminating at its upper and immediately adjacent the buttocks-thigh interface to form a seat and terminating at its lower end adjacent the knee, said second support means including a second portion extending along the calf, said second support means terminating at its upper end adjacent the knee and at its lower end adjacent the foot, said flexure means being located adjacent said knee and connected between said first and second support means for permitting the person to repeatedly freely bend and unbend said knee through any angular range up to a predetermined angle of bend and for providing substantial resistance to flexure therebeyond, said first and second support means including securement means for releasably securing said system to said leg.

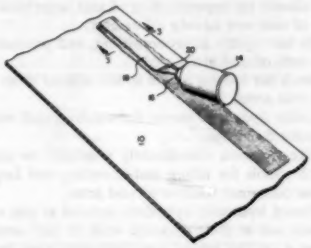
4,450,833

METHOD OF DIMENSIONING A POLYURETHANE FOAM BANDAGE

William R. Brooks, 260 Arlington, Elmhurst, Ill. 60126, and Irving C. Heinzel, 45 Brookdale La., Palatine, Ill. 60067

Filed Dec. 2, 1981, Ser. No. 326,933
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—90 **9 Claims**

1. The method of making a cellular synthetic bandage member which comprises the steps of: providing a dispenser package which includes a water-activatable prepolymer composition under superatmospheric pressure and a blowing agent for said composition; storing said package; thereafter infusing a trimerizing catalyst throughout said packaged composition in continuation of said superatmospheric pressure and at substantially the time of use; dispensing an elongate quantity of said composition into contact with a fabric element at ambient pressure whereby to activate said blowing agent in causing said composition to form flexible froth foam adhering to said fabric element; applying mechanical compressive force to said froth foam to squeeze said foam into intimate contact with said fabric element, reduce the thickness dimension of said foam, and embed said fabric element in said foam; and contacting the



surfaces of the resultant foam bandage member with moisture while making a medical dressing, whereby to cause said moisture to react said prepolymer composition in the presence of said trimerizing catalyst, partially restoring the pre-compressed thickness of said foam and its cellular structure and curing the foam to a level of optimum properties.

4,450,834

EXTERNAL FIXATION DEVICE

David A. Fischer, Minneapolis, Minn., assignor to Ace Orthopedic Manufacturing, Inc., Los Angeles, Calif.

Division of Ser. No. 85,996, Oct. 18, 1979, Pat. No. 4,308,863.
This application Aug. 7, 1981, Ser. No. 290,740
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 EB **5 Claims**

1. A method of installing a pin extending from the soft tissue and bone of a user substantially parallel with a previously installed pin in an external fixation device comprising the steps of:

clamping an exposed free end of said previously installed pin into one aperture of a multi-aperture pin holder;

inserting a tubular sheath through an adjacent one of said apertures in said pin holder;

extending said sheath through said soft tissue to contact said bone;

inserting a drill through said sheath to drill a hole through said bone along an axis parallel to the axis of said sheath;

removing said drill from said sheath;

measuring the diameter of said bone at the location of said hole;

inserting a pin through said sheath and into said hole drilled in said bone;

withdrawing said sheath from said pin holder while maintaining said pin within said bone; and

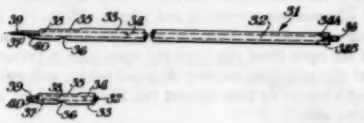
clamping the exposed free end of the newly installed pin into said adjacent aperture in said pin holder.

4,450,835

METHOD AND SYSTEM FOR INSERTING A SURGICAL WIRE

Stanley E. Asnis, Port Washington, N.Y., and Rocco R. Borzone, Emerson, N.J., assignors to Howmedica, Inc., New York, N.Y.

Division of Ser. No. 236,089, Feb. 20, 1981, Pat. No. 4,383,527. This application Feb. 22, 1983, Ser. No. 468,245
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 EB 5 Claims



1. In combination

a surgical guide pin having a distal end, a proximal end and a uniform circular cross-section along the major portion of its length between said two ends, and

a substantially cylindrical external sleeve having a distal end and a proximal end and receiving the guide pin for sliding fit in a centrally disposed longitudinal bore therein,

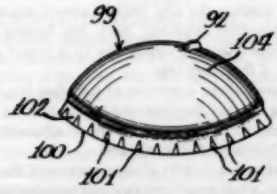
with the guide pin being longer than the external sleeve, the guide pin and the external sleeve being provided at their proximal ends with cooperating cutting surfaces, and the guide pin and the external sleeve being provided at their distal ends with means interacting to (1) prevent relative rotational movement between the guide pin and the external sleeve when they are in a first relative position in which the distal tip of the guide pin extends beyond the distal tip of the external sleeve and the proximal tip of the guide pin extends beyond the proximal tip of the external sleeve, and (2) permit relative rotational movement between the guide pin and the external sleeve when they are in a second relative position in which the guide pin is displaced proximally relative to said first relative position.

4,450,836

CUSTOM VALVED CERVICAL CAP WITH DEFORMABLE MARGIN

Robert A. Goepp, Chicago; Uwe E. Freese, Oak Park, and Marvin P. Loeb, Chicago, all of Ill., assignors to University Patents, Inc., Norwalk, Conn. and Contracap, Inc., Schaumburg, Ill.

Division of Ser. No. 163,328, Jun. 26, 1980, Pat. No. 4,369,219. This application Sep. 27, 1982, Ser. No. 424,227
Int. Cl.³ A61F 5/46
U.S. Cl. 128—127 45 Claims



1. A non-invasive birth control device which comprises

a cup-shaped elastomeric shell having a convex outer surface and a concave inner surface that is substantially complementary with contiguous surface of portio vaginalis cervicis in its actual configuration when in contact therewith, said shell defining an aperture at the apex thereof and having a depth sufficient to receive a major portion of said portio, but the periphery of said shell terminating short of fornices vaginae;

a skirt portion integral with said shell, depending from said shell at the periphery of said shell, and having a thickness that is less than the thickness of said shell; said skirt portion having a plurality of spaced slits extending from the peripheral edge of the skirt portion; and

an elastomeric web over said aperture and secured to said outer surface about said aperture defining a passageway communicating with said aperture and providing a discharge port along said convex outer surface and offset from said aperture;

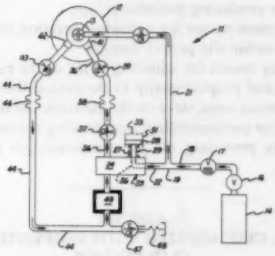
said web conforming to and coacting with a contiguous portion of said convex outer surface to provide a one-way valve means for uterine discharge entering said aperture from within said shell.

4,450,837

UNDERWATER BREATHING APPARATUS

Norman E. Ream, Woodland, Calif., assignor to Kelsey W. Hatcher, Woodland, Calif.

Filed Jun. 7, 1982, Ser. No. 385,338
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.27 3 Claims



1. A self-contained underwater breathing apparatus comprising:

a. a fresh air container;

b. a primary fresh air breathing supply circuit including a face mask, a first conduit extending from said fresh air container to said face mask, and a demand regulator on said face mask having a metering orifice releasing approximately two liters of fresh air to the breathing organs of the user during each inhalation cycle of the user's breathing organs;

c. a secondary recirculating gas breathing supply circuit including a chamber, an exhaust hose connecting said face mask to said chamber to conduct thereto air exhaled from the breathing organs of the user during each exhalation cycle, a CO_2 and moisture absorbing canister interposed in said exhaust hose, and an intake hose connecting said chamber to said face mask;

d. a fresh air makeup supply circuit including a second conduit in communication with said fresh air container and extending to said chamber for the transfer of fresh air thereto;

e. a valve located within said chamber and connected to said second conduit; and,

f. piston means associated with said valve for sensing the water pressure of the ambient environment and controlling said valve to effect the release of fresh air into said chamber in an amount dependent upon the water pressure, the dimensions of said valve and said piston means being selected to afford to the user's breathing organs the quan-

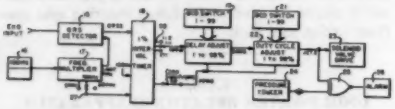
tity of fresh air plus recycled exhaled air needed, in conjunction with the two liters of fresh air released from said demand regulator, to meet both the oxygen requirements and the pressure requirements of the user's breathing organs exacted by the ambient environment at each inhalation.

4,450,838

JET VENTILATOR CONTROL SYSTEM

Saul Miodownik, New York, N.Y., assignor to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Feb. 10, 1981, Ser. No. 233,244
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.23 **10 Claims**



1. A control system for a jet ventilator having means for controllably providing jet ventilation gas pulses to a patient, the control system comprising:

means for producing periodic pulses;

pulse-duration means for adjusting duration of the periodic pulses within the period thereof;

pulse-delay means for adjusting delay of the periodic pulses within and proportionally to the period thereof; and

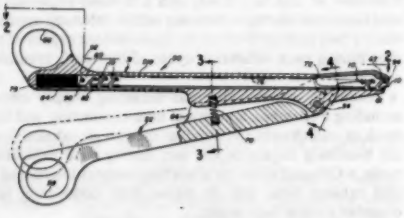
control means responsive to the duration and delay adjusted pulses for correspondingly controlling the means for controllably providing the jet ventilation gas pulses to the patient.

4,450,839

SURGICAL CLIP APPLIER WITH SERPENTINE SPRING CLIP FEEDER

James A. Transue, Union, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 26, 1982, Ser. No. 352,833
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **11 Claims**



11. A scissors-type medical instrument for repeatedly applying a plurality of ligating clips seriatim about tissue wherein each said clip is initially provided in an open state and wherein each said clip comprises first and second legs which are joined at a leg connection end of the clip and which are spaced apart at their distal ends; each said clip including a base extending along at least a portion of said first leg and including means for being guided and retained by, and for supporting said clip in, said instrument; said instrument comprising:

first and second handles mounted together for pivotal movement about a pivot axis, each said handle extending forwardly beyond the pivot axis to form a clip closing jaw, said jaws having opposing clip engaging faces;

means associated with said first and second handles for limiting the pivoting movement of said handles to a maximum opening of said jaws;

said first handle including a guideway for receiving a plurality of said open clips in a single row with the clips arranged in end-to-end relationship with the distal end of said first leg of one clip abutting the leg connection end of the next forwardly adjacent clip, said first handle including clip retaining means along said guideway for engaging said clip base to retain said clip in sliding engagement within said first handle in said guideway;

means on said second handle jaw for engaging said second leg of the front clip in said row of clips when said jaws are at said maximum opening and when the front clip is open and positioned between the open jaws whereby discharge of the open front clip from the open jaws is prevented;

a last clip engaging member disposed within said guideway and adapted to bear against the last clip in said row of clips; and

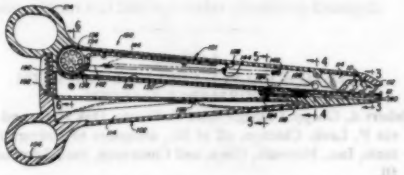
a serpentine spring disposed within said guideway and adapted to be compressed behind said last clip engaging member for moving said row of clips forwardly along said guideway to said jaws.

4,450,840

LIGATING CLIP WITH FLANGED BASE HAVING A RECESSED ENGAGING FACE

Robert W. Mericle, Lebanon, and James A. Transue, Union, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 26, 1982, Ser. No. 352,834
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **12 Claims**



1. A ligating clip adapted to be applied to tissue, each said clip comprising:

first and second legs joined at their proximal ends by a resilient hinge to define the rear end of the clip and terminating at their distal ends at the front of the clip in latch means for holding the clip latched closed when the clip legs are squeezed together, each leg having a vessel clamping inner face in opposition to a vessel clamping inner face of the other leg;

a base extending along a portion of said first leg, said base terminating short of the distal end of said first leg in a front face whereby an open recess is defined adjacent said base front face below said first leg; and

flanges extending rearwardly along a portion of the length of said base from said base front face and terminating short of said first leg proximal end, said flanges extending laterally outwardly beyond the sides of the first leg, the portion of said base that extends along said first leg between said first leg proximal end and said flanges having a width not greater than the width of said first leg.

4,450,841

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

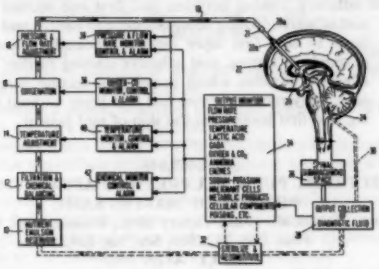
Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 354,346, Mar. 3, 1982, which is a continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797, and Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 275,117, Jun. 18, 1981, each is a division of Ser. No. 139,886, Apr. 14, 1980. This application Sep. 30, 1982, Ser. No. 428,687

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[3] A61K *31/00*; A61M *5/14*

U.S. Cl. 128—632 26 Claims



1. A method of diagnosing the condition of suspected hypoxic-ischemic central nervous system tissue of a mammal, comprising:

(a) providing a synthetic spinal fluid comprising at least one oxygenated oxygen-carrying component and essential electrolytes to compatibilize the oxygen-carrying component for use with central nervous system tissue;

(b) injecting said synthetic spinal fluid into at least a first portion of the cerebrospinal pathway of said mammal to contact said tissue to become a diagnostic fluid;

(c) withdrawing said diagnostic fluid from a second portion of said pathway to create a circulation of said fluid through at least a portion of said pathway;

(d) monitoring the composition of said diagnostic fluid; and

(e) comparing constituents of said fluid for at least a selected difference in the compositions of said synthetic spinal and diagnostic fluids;

whereby said selected differences in said compositions are at least diagnostic of the condition of said suspected hypoxic-ischemic tissue disposed along said portion of said cerebrospinal pathway.

4,450,842

SOLID STATE REFERENCE ELECTRODE

Gregory L. Zick, Seattle, Wash., and Stanley H. Saulson, Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 143,927, Apr. 25, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 318,693

Int. Cl.[3] A61B *5/00*

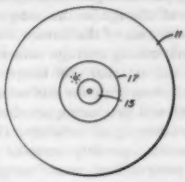
U.S. Cl. 128—635 7 Claims

1. A solid state sensor for measuring the oxygen of blood by contact with a patient's skin, said sensor comprising:

a thin ceramic substrate disc having front and back surfaces;

a noble metal cathode, extending through said substrate from the back surface to the front surface where, at a first limited area of said front surface, said cathode is exposed for reducing oxygen; and

a reference electrode comprising a mixture of silver, silver chloride and a fused glass frit forming a conductive film



coating over a second limited area of said disc front surface.

4,450,843

MINIATURE BIOFEEDBACK INSTRUMENT

George M. Barney, Dallas, and Paul R. Michaelis, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 209,564

Int. Cl.[3] A61B *5/02*

U.S. Cl. 128—690 5 Claims

1. A body-mountable instrument for providing biofeedback information pertaining to the human body of a user thereof, said instrument comprising:

temperature sensing means adapted to be disposed in contact with the body of a living human for detecting the external skin temperature of the human body and providing a temperature signal output indicative of the magnitude thereof;

heart beat sensing means adapted to be disposed in contact with the body at an appropriate location thereon for detecting the heart beats of the human body and providing a heart beat signal indicative thereof;

processing means including:

time-keeping means for keeping track of the elapsed time, means operably coupled to said temperature sensing means and periodically at predetermined time intervals of a constant multiple within the elapsed time as established by said time-keeping means operating upon said temperature signal output of said temperature sensing means for determining a time rate of change in the external skin temperature of the human body over a predetermined time interval and producing an informational biofeedback output signal indicative thereof,

means operably coupled to said heart beat sensing means and responsive to said heart beat signal and elapsed time for determining the current pulse rate and the time rate of change in the pulse rate of the human body over a predetermined time interval and producing additional

informational biofeedback output signals respectively indicative thereof,

said processing means being operable during a selected monitoring period to periodically determine the current time rates of change in the external skin temperature and the pulse rate of the human body, and

means for determining average values for the time rates of change in the external skin temperature and the pulse rate of the human body for said monitoring period at the end thereof and producing another informational biofeedback output signal indicative thereof; and

presentation means operably coupled to said processing means, said presentation means being responsive to said informational biofeedback output signals for providing a real-time indication of the external skin temperature of the human body at any given time instant and the time rate of change in the external skin temperature of the human body, a real-time indication of the pulse rate of the human body at any given time instant and the time rate of change in the pulse rate of the human body, and an indication of said average values for the time rates of change in the external skin temperature and the pulse rate of the human body during said monitoring period.

4,450,844

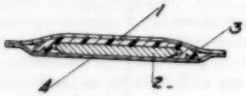
PATCH SYSTEM FOR USE ON THE SKIN

Robert A. Quisno, Monroe, Ohio, assignor to Hill Top Research, Inc., Cincinnati, Ohio

Filed Nov. 23, 1981, Ser. No. 324,048

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—743 **11 Claims**



1. A patch system for use on skin for predictive testing, diagnostic testing and dermal drug delivery, said patch system comprising an open-faced, integral, one-piece housing of non-toxic, inert, soft and flexible material, said housing having a substantially planar central body portion terminating in a peripheral body portion of substantially arcuate cross section curving outwardly and downwardly below said central body portion, said peripheral body portion terminating in an outer skin-contacting edge, an inner skin-contacting edge depending downwardly from said peripheral body portion, said skin-contacting inner and outer edges being parallel and spaced from each other and each being continuous, said skin-contacting inner and outer edges being coplanar, being the only skin-contacting portions of said housing, and having an air space therebetween.

4,450,845

DEVICE FOR SHIELDING HUMAN SKIN FROM AMBIENT LIGHT TO FACILITATE TESTS PERFORMED THEREON

Rolf R. Engel, St. Paul, Minn., assignor to Minneapolis Medical Research Foundation, Inc., Minneapolis, Minn.

Filed Feb. 22, 1982, Ser. No. 350,563

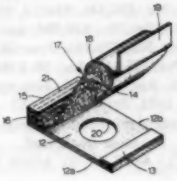
Int. Cl.³ A61B *5/00*

U.S. Cl. 128—743 **7 Claims**

1. A device for shielding a portion of the skin of a human patient to facilitate the performance of tests on the skin via a testing instrument, said device comprising:

a first layer having a bottom surface and a top surface, said bottom surface having an adhesive layer thereon for adhesion to the skin of the human on which the test is to be performed, said first layer having an opening therethrough to permit selective access by said testing instrument to the portion of the skin exposed by said opening;

a second, opaque layer positioned above said top surface of said first layer covering said opening and being secured thereto by a hinge means for permitting selective and repeated removal of at least a portion of said second layer from the area of said opening to permit periodic access by said testing instrument; and



an adhesive coating between said first and second layers, said adhesive coating being effective to adhere said second layer to said first layer despite repeated removals for purposes of testing, said adhesive coating further having adhesive qualities which permit said second layer to be selectively removed from said first layer without removing said first layer from the skin of said patient.

4,450,846

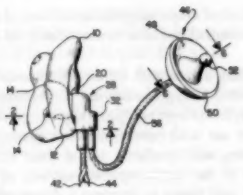
ELECTRICAL PULSE ACUPRESSURE APPARATUS AND METHOD OF MAKING SAME

Francis J. McCall, 19231 Victory Blvd., Reseda, Calif. 91335

Filed Dec. 24, 1981, Ser. No. 334,317

Int. Cl.³ A61N *1/02*

U.S. Cl. 128—789 **3 Claims**



1. An electrical pulse acupressure apparatus adapted to be worn by a human being in contact with the ear, said apparatus comprising:

an electrical pulse applicator, said applicator to closely conform in a tight fitting manner with the interior of the ear, said applicator to be carried by the human being, metallic nodule means mounted within an exterior surface of said applicator, said applicator being adapted to receive electrical pulses from an electrical pulse generating means and conduct such through said metallic nodule means into the body of the human being, said nodule means to be located against at least one acupuncture point of the body of the human being to thereby treat a corresponding body function;

electrical connection means formed within said applicator, said applicator having an interior chamber, said electrical connection means including a hardened paste substantially completely filling said internal chamber, said metallic nodule means connecting with said hardened paste, said hardened paste being electrically conductive;

a female plug having at least one electrical connector, said female plug being embedded within said hardened paste; and

a male plug assembly being electrically connected with said electrical connector of said female plug, whereby the electrical pulses from said electrical pulse generating means are conducted through said male plug and said female plug and through said hardened paste to said nodule means.

4,450,847

WRAPPER FOR SMOKING ARTICLES AND METHOD

William F. Owens, Pisgah Forest, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Apr. 7, 1982, Ser. No. 366,315
Int. Cl.³ A24D 1/02
U.S. Cl. 131—365 16 Claims

1. A wrapper for smoking articles such as cigarettes, cigars and the like comprising a cellulosic sheet containing, as filler, a small fraction of freshly precipitated amorphous magnesium hydroxide gel coated on or applied to the fibers of the sheet wherein the small fraction of amorphous magnesium hydroxide gel comprises 5% to 50% by weight of the total filler.

4,450,848

ARTIFICIAL FINGERNAIL FORMING METHOD, COMPOSITION AND KIT

Elisa L. Ferrigno, 107 Glen Rd. - Apt. 4C, Yonkers, N.Y. 10470

Filed Sep. 29, 1982, Ser. No. 427,105
Int. Cl.³ A45D 29/00
U.S. Cl. 132—73 5 Claims

1. A method of forming an artificial fingernail on a natural fingernail, comprising the steps of:

a. adhering a plastic fingernail tip to the top surface of the free end of a natural fingernail;

b. applying a thin coating of a liquid cyanoacrylate adhesive to the top surface of the natural fingernail rearward of the tip;

c. applying a thin layer of an acrylic ester polymer in powder form on the adhesive coating while still wet;

d. applying a second thin coating of said liquid cyanoacrylate to the surface of the layer after drying; and

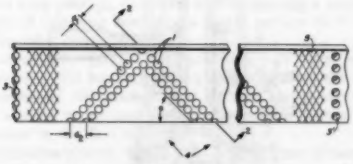
e. buffing the surface until smooth after the liquid dries.

4,450,849

DENTAL PHYSIO-TAPE

Chris A. Cerceo; Jeanie F. Kaufman, both of Box AP, 3443 Lake Tahoe Blvd., Suite F, South Lake Tahoe, Calif. 95705, and Martin H. Kaufman, Box 243, Ridgecrest, Calif. 93555

Filed Sep. 27, 1982, Ser. No. 423,860
Int. Cl.³ A61C 15/00
U.S. Cl. 132—89 19 Claims



1. A dental tape having length, width, edges and two sides for removing plaque from the teeth comprising a strong, flexible, tear-resistant tape having a multitude of rows of protuberances fixed in place which are aligned obliquely to the length of the tape, having preselected spacing between said rows and between said protuberances, and which lift debris in a preferred direction away from the base of the teeth towards the ends of the teeth, the debris riding along the rows aligned obliquely.

4,450,850

CRUTCH FOR USE ON AN ICY SURFACE

William A. McKenna, 2925 Sunset Dr., Bellingham, Wash. 98225

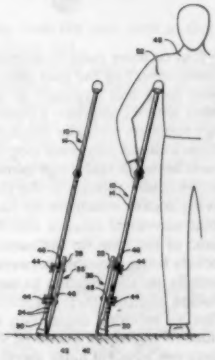
Filed Apr. 30, 1982, Ser. No. 373,607
Int. Cl.³ A61H 3/02
U.S. Cl. 135—78 4 Claims

1. A crutch assembly particularly adapted for use on an icy surface, as well as on a finished ground surface, said assembly comprising:

a. a crutch member having a longitudinal axis and also having an upper gripping portion adapted to be held by a person in a first position and in a second position where the crutch member is rotated approximately 180° about the longitudinal axis relative to the first position, said crutch member in said first and second positions extending downwardly at a slant away from the person with the longitudinal axis being at a slanted angle to the ground surface within a predetermined angular range, said crutch member having a first side which faces toward the person with the crutch member in the first position and a second side which faces toward the person with the crutch member in the second position;

b. a first ground engaging member mounted to the lower end of the crutch member and having a blunted ground engaging surface adapted to frictionally engage a finished ground surface;

c. a second ground engaging member having a ground engaging tip adapted to engage an icy surface, said second ground engaging member being firmly attached to said crutch member so as to have a substantially fixed position relative to said crutch member;



d. said second ground engaging member being positioned with its tip on the second side of the crutch member relative to the ground engaging surface of the first ground engaging member, said tip being at a level relative to the ground engaging surface of the first ground engaging member so that with the crutch member in its first position, the tip is out of contact with the ground surface and with the crutch member in the second position, the tip comes into contact with the ground engaging surface;

e. said first ground engaging member having a first surface portion that comes into initial ground engagement with the ground surface when the crutch member is in the first position, said first surface portion being positioned at a first plane perpendicular to said longitudinal axis and being compressible through a first distance to a second plane also perpendicular to the longitudinal axis, the tip of the second ground engaging member being positioned above a third plane perpendicular to the longitudinal axis, the third plane being below the secnd plane by a distance equal to the cotangent of the slanted angle times a lateral distance from the first surface portion to the tip of the second ground engaging member; whereby the crutch assembly can be used in the first position without the tip digging into the ground surface, and on any icy surface the crutch assembly can be used in the second position so that the tip firmly engages the icy surface to prevent slippage.

4,450,851

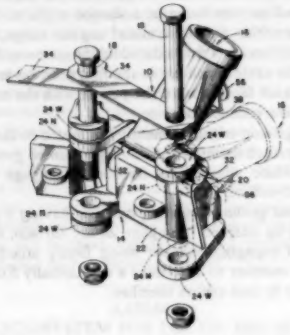
FREE-STANDING COLLAPSIBLE TENT FRAME STRUCTURE AND HUB ASSEMBLY THEREFOR

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Dec. 15, 1981, Ser. No. 330,885

Int. Cl.³ A45F 1/16

U.S. Cl. 135—109 **4 Claims**



1. For use with four or more radially-extending struts and a tension member interconnecting the ends thereof to produce a collapsible subframe for a tent structure or the like, the improved hub assembly which comprises: a chain of at least four double-ended hinge members pivotally interconnected at their adjacent ends to form a closed polygonal loop thereof, the axes of pivotal movement between said hinge members paralleling one another in perpendicular relation to the plane of the loop; and, a strut-receiving socket attachable to each of the hinge members for pivotal movement relative thereto about an axis paralleling the plane of the loop on the outside thereof, said strut-receiving sockets being movable between a fully-folded position in substantially parallel relation to one another and a fully-unfolded position abutting their respective hinge members so as to define an included angle with respect to their fully-folded positions of slightly in excess of 90°, and the pivotal connections between adjacent hinge members cooperating with their respective strut-receiving sockets when so connected to permit adjustment of the included angle between the latter through an angle of approximately 0° and between 90° and 180° in fully-unfolded position.

4,450,852

GAS SWITCHING DEVICE

Raymond S. Gregory, Bingley, England, assignor to The Medishield Corporation Limited, London, England

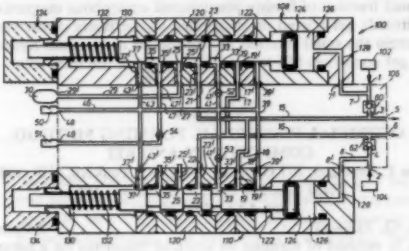
Filed Dec. 28, 1981, Ser. No. 334,780

Claims priority, application United Kingdom, Jan. 6, 1981, 8100216

Int. Cl.³ G01L 19/12

U.S. Cl. 137—114 **9 Claims**

1. A gas switching device for use with a gas supply system in which first and second gases are each supplied from a source to a unit at a predetermined pressure, the sevice being positioned upstream of the unit and comprising a manifold having a first inlet and outlet for the passage therethrough of the first gas and a second inlet and outlet for the passage therethrough of the second gas, a first valve assembly associated with the first gas and a second valve assembly associated with the second gas, each valve assembly being operable independently of the other valve assembly and including a member movable from a first to a second position under the influence of the pressure of its associated gas at its inlet to the manifold, each valve assembly having an inlet communicating with a passageway in the manifold which, in turn, communicates with the inlet of the manifold for the other gas, and an outlet spaced from said inlet, said outlet communicating with a second passageway in the manifold which, in turn, communicates with the outlet in the manifold for the associated gas, the arrangement being such that whilst the predetermined pressures of the first and the second gases at each respective inlet to the manifold are maintained, the members each occupy the first position thereby isolating each valve assembly inlet from its outlet, but if the pressure of



one gas from its source should drop below its predetermined value then the member of the valve assembly associated with that gas will move to its second position thereby permitting the passage of the other gas from the inlet to the outlet of that valve assembly so that said other gas exits from the first and the second outlets of the manifold to maintain the total flow of gas from the switching device substantially constant.

4,450,853

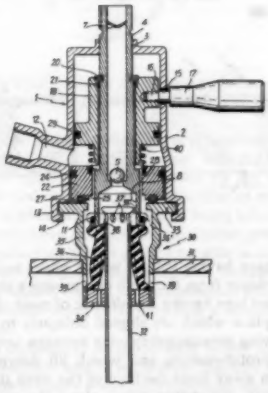
ASSEMBLY FOR DRAWING OFF A LIQUID BY MEANS OF A GAS UNDER PRESSURE

Robert Dessenoix, 11, Chennevières St., and Pierre Dessenoix, 2, Veluché Rd., both of 79600 Airvault, France

Filed Jul. 21, 1981, Ser. No. 285,525

Int. Cl.³ F16L 39/00

U.S. Cl. 137—212 **3 Claims**



1. In a draw-off assembly comprising a head for drawing off a liquid by means of a gas under pressure, adapted to be connected to a plunger tube assembly sealably traversing the wall of a container for storing safe liquid, comprising a body, in which is slidable a mobile member including a mobile central tube and a piston, said mobile central tube having a lower end which is adapted to be sealably connected to the plunger tube by controlled descent with respect to the body, said body comprising a gas inlet pipe leading to an annular space made between the mobile central tube, the body itself and a lower

annular valve wherein said lower annular valve is mounted between the body and the mobile central tube for sliding freely inside said body and outside said mobile central tube, said annular valve having a front sealing ring and being urged toward a lower end of said body, said body having a coupling means for connection with a flange of said plunger tube assembly whereby said front sealing ring is in sealing contact with said flange when said coupling means is connected with said flange independently of the said mobile central tube in said body, said lower annular valve being urged by a spring abutting on said mobile member constituted by said mobile central tube and said piston.

4,450,854

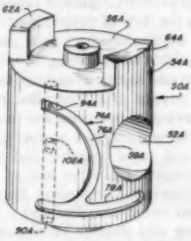
LUBRICATED SPLIT PLUG VALVE

William H. Alexander, and Joe R. Burger, both of Houston, Tex., assignors to Vapor Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 215,728, Dec. 12, 1980, Pat. No. 4,393,893. This application Feb. 25, 1983, Ser. No. 469,791

Int. Cl.³ F16K *5/22*

U.S. Cl. 137—246.12 **4 Claims**



1. In a fluid control valve of the type having a plug closure member rotatable between open and closed positions for controlling pressurized product flow therethrough by alignment of apertures in the valve body and ports on the closure member and a passage therethrough, a lubrication system comprising;

first and second plug halves defined along a plane intersecting said plug at an angle oblique to the longitudinal axis of said plug passage, each said half containing a major portion of one plug inlet, and a minor portion of the other plug inlet, respectively;

a semi-circular groove on each plug half outer surface, having a first leg peripherally displaced from the bottom portion of the semi-circular groove and a second leg extending under said major inlet portion which is connected to the first leg;

a continuous groove in said body adjacent to and essentially surrounding a portion of each body aperture, and including a portion in fluid communication with said semi-circular groove first and second leg;

ports in said body and said semi-circular groove for communicating said body and said semi-circular groove for admitting sealant/lubricant therethrough;

wherein pressurized sealant introduced via said sealant ports enters said body and said semi-circular groove in both the open and closed valve positions.

4,450,855

REMOVABLE CONDENSATE COLLECTOR FOR ELEVATED WATER STORAGE FACILITIES

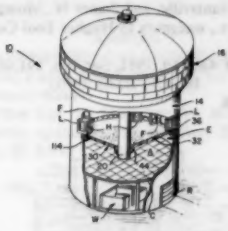
Richard E. Hills, Coraopolis, Pa., assignor to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1982, Ser. No. 361,136

Int. Cl.³ E03B *11/00, 9/00*

U.S. Cl. 137—312 **14 Claims**

1. An improvement in an elevated water storage facility comprising: a water storage tank supported on top of an enclosed column and a partition extending across the column dividing the enclosed column into an air space above the partition and a work area for offices, warehouses, and the like located beneath the partition with elements located in the work area which can be damaged by condensate falling thereonto from the tank; collecting means for collecting condensed water vapor which drips from the underside of said tank, the collecting means including attaching means mounted on a wall of the enclosed column above the partition, a membrane attached to said attaching means and mounted inside the column at a location between the tank and the partition for collecting any



condensate falling from the tank prior to that condensate falling onto the partition; and

membrane strengthening means for internally reinforcing and strengthening the membrane to permit water collected on the membrane to be retained on the membrane for a period of time until evaporation and ventilation can remove that collected water from the elevated water storage facility; and ventilation means being disposed with the column and open to the outside atmosphere for facilitating ventilation through the facility to remove said collected water.

4,450,856

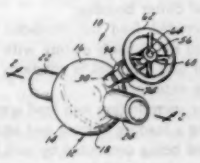
MEANS FOR RELEASABLY SECURING HAND-WHEEL TO VALVE SPINDLE

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Jul. 25, 1983, Ser. No. 516,898

Int. Cl.³ F16K *43/00, 31/50*

U.S. Cl. 137—315 **7 Claims**



1. A valve comprising:

a sleeve;

a rotatable spindle extending from said sleeve;

a hollow bonnet surrounding said spindle and sleeve and threadably secured to the latter;

an operating member having a hub with a hole therein for attachment to the outer end of said spindle;

and means for releasably connecting said operating member to said spindle comprising: a pin-hole parallel to said hole in said hub and defined by registering adjacent depressions formed in said hub at the side of said hole therein and in a side of said outer end of said spindle, and a flanged pin inserted in said pin-hole, said pin being removed from said pin-hole in response to unscrewing of said bonnet which engages and moves said operating member axially off of

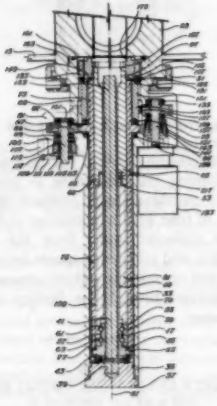
said spindle, which movement of said operating member forces said pin from said pin-hole.

4,450,857

DEVICE FOR TAPPING AND PLUGGING A FLUID CONDUCTOR

John L. Baugh, Huntsville, and James W. Montgomery, Houston, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,661
Int. Cl.³ B23B 39/00
U.S. Cl. 137—318 8 Claims



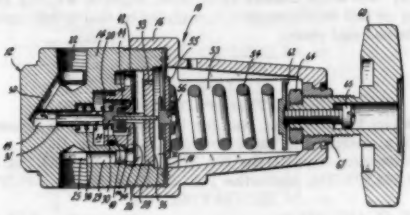
1. A device for tapping a fluid conductor, comprising;
a cutter housing;
mounting means for mounting said cutter housing on the exterior of said fluid conductor to be tapped;
an externally threaded lead screw mounted in a fixed position within said cutter housing;
an internally threaded feed nut threaded onto said lead screw, said feed nut threads mating with said lead screw threads so that said feed nut is rotatably movable along said lead screw exterior;
a cutting cylinder surrounding said lead screw, said cutting cylinder having a leading cutting end and a trailing end, said trailing end being contacted by said feed nut as said feed nut moves along said lead screw exterior, thereby driving said cutting cylinder along a drive axis transverse to the longitudinal axis of said fluid conductor;
a feed sleeve surrounding said cutting cylinder within said housing;
slot means on said feed sleeve for engaging said feed nut whereby rotation of said feed sleeve causes rotation of said feed nut;
a feed motor operably associated with said feed sleeve for rotating said feed sleeve;
a drive sleeve positioned about said cutting cylinder in said housing;
engaging means on said drive sleeve for rotating said cutting cylinder;
a drive motor independent of said feed motor and operably associated with said drive sleeve for rotating said drive sleeve.

4,450,858

GAS PRESSURE REDUCING REGULATOR

Byron H. Acomb, Florence, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 147,860, May 8, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 386,999
Int. Cl.³ F16K 31/12
U.S. Cl. 137—505.37 2 Claims



1. A single stage pressure regulator resistant to oxygen burnout for regulating the flow of oxygen supplied to the regulator from a source of oxygen at a high inlet gas pressure comprising: a hollow regulator body having an inlet opening adapted to be connected to said source of oxygen; an outlet opening for discharging said oxygen at a controlled reduced pressure; a valve chamber having an upstream and downstream end relative to the flow of said oxygen; a control chamber; a valve disposed within said valve chamber and including a slidable valve member containing a valve seat of elastomer material with a high resistance to combustion disposed at the downstream end of said valve chamber and a valve stem; spring means surrounding said slidable valve member at a location separated from the inlet gas flow path for urging said valve into a closed position; a nozzle assembly having a nozzle head for separating said valve chamber from said control chamber, said nozzle head having a frustoconical tapered extension juxtaposed relative to the valve seat for sealing off the valve upon loss of valve seat material; a bonnet having a bonnet chamber; diaphragm means for separating said bonnet chamber from said valve chamber and for forming a diaphragm chamber, with said diaphragm means including a flexible diaphragm and with said valve stem extending through said nozzle head into said diaphragm chamber in biased engagement with said diaphragm, a bleeder hole located in said nozzle head for controllably restricting the flow of gas from said control chamber to said diaphragm chamber so as to isolate the diaphragm from direct contact with inrushing gas through said valve; and first and second conduit means communicating with the valve chamber at the upstream end thereof, said first and second conduit means having axes which intersect to form an included angle of less than ninety degrees with one of said conduit means being concentric with the longitudinal axis of said valve assembly.

4,450,859

SAFETY VALVE

Ulf C. Bergman, Malmoe, Sweden, assignor to Mechanical Technology Inc., Latham, N.Y.

Continuation of Ser. No. 308,250, Oct. 5, 1981. This application Mar. 29, 1983, Ser. No. 480,111
Int. Cl.³ F16K 17/04, 25/00
U.S. Cl. 137—516.29 4 Claims

1. An improved safety valve of the kind including a housing, a valve member axially movable therein from a closed valve position to an open valve position, a prestressed compression spring mounted between said member and said housing, a first opening located centrally in said housing and surrounded by an annular valve seal lying in a plane perpendicular to the direction of movement of said valve member, a second opening in said housing arranged remote from said seat, and a resilient

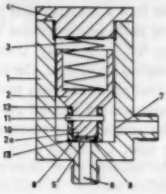
gland operatively associated with said valve member and adapted to abut said valve seat in the closed position, wherein the improvement comprises:

a shoulder on said valve member;

a sleeve surrounding said valve member, said sleeve having a top and bottom end and having an inner diameter greater than the outer diameter of said valve member to allow relative axial movement of said sleeve in an upward direction;

the top end of said sleeve limiting the distance of said relative upward axial movement by engagement with said valve member shoulder;

the bottom end of said sleeve forming an axial extension beyond said valve member so as to surround said resilient gland and to contact a part of said valve seat in the closed valve position such that said sleeve acts as a support for said gland in the closed valve position;



means for connecting said valve member and said sleeve to provide limited relative axial movement of said sleeve in a downward direction in the open valve position such that said sleeve shields said gland from high velocity fluid in the open valve position; and

an inwardly directed flange on said bottom end of said sleeve for engaging said resilient gland such that the relative axial movement of said flange in said upward direction compresses said gland in the closed valve position and the expansion of said resilient gland against said flange causes axial movement of said sleeve in the downward direction in the open valve position,

said connecting means also allowing said limited movement of said sleeve relative to said valve member in the upward direction in the closed valve position, said limited upward movement also limiting the compression of said resilient gland by said valve member.

4,450,860

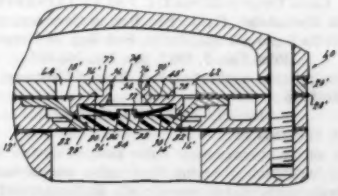
DISCHARGE VALVE GUIDE

Woodie R. Francis, and James F. Fogt, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Feb. 13, 1981, Ser. No. 234,169

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—543.19 **18 Claims**



14. An improved valve plate assembly for use in a compressor comprising:

a valve plate means having a discharge opening extending therethrough and means defining a valve seat in said discharge opening;

leaf spring biasing means having a convex surface and a concave surface;

a valve member engageable with said valve seat to close said discharge opening and including a spring seat, said spring seat engaging a porition of said convex surface of said leaf spring; and

retainer means secured to said valve plate means and including means engaging said valve plate means to prevent movement of said retainer means in a direction away from said valve member, said retainer means engaging a portion of said concave surface of said leaf spring so as to bias said valve member into said closed position.

4,450,861

COMPRESSED GAS SAVING DEVICE

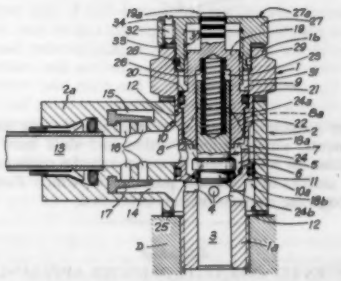
Daniel Bouteille, 2 Allée des Chataigniers "Le Monastère", Ville d'Avray, France (92410)

Filed Apr. 16, 1981, Ser. No. 254,618

Claims priority, application France, Apr. 23, 1980, 80 09141; Dec. 18, 1980, 80 26943

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—553 **10 Claims**



1. A compressed gas saving device for use in a pipe system connecting a control valve outlet to the inlet of a pressure user apparatus, said device comprising a body formed with a first passage extending from a first end to a second end of said body, means adjacent said second end connecting said first passage to said control valve outlet, means connecting said first passage to said pipe system, a seat in said first passage, a valve adapted to engage said seat to close said first passage, a return spring member for urging said valve into engagement with said seat, means including a manually operable member for adjusting the force exerted by said spring member on said valve, said spring member opposing the rising force of the valve generated by the gas flowing from the control valve, a second passage provided in the body, said second passage constituting a shunt in parallel with the first passage for bypassing said valve, said second passage provided with a one-way valve, the flow direction of which is that of gas issued from the pressure-user apparatus, a visual indicator positionable with relation to an external surface of said body, and means responsive to said adjusting means for positioning said visual indicator.

4,450,862

PINCH VALVE ASSEMBLY

Thomas H. Hogan, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 13, 1981, Ser. No. 234,133

Int. Cl.³ F16K *31/126*

U.S. Cl. 137—595 **15 Claims**

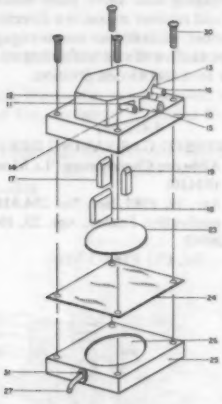
1. A valve assembly for controlling fluid flow through a plurality of resilient tubes comprising:

a base;

a housing attached to said base, said housing having a plurality of passageways extending therethrough for receiving a

resilient tube in each of said passageways, said housing further having a slot associated with each of said passageways extending transversely from said passageways toward the bottom of said housing:

a plurality of slide elements, a said slide element located in each of said slots for reciprocal movement therein independent of said other slide elements; and



a single actuation means for reciprocally moving said slide elements, simultaneously within said slots from a first position, at which fluid flow through the resilients tubes can occur, to a second position, at which fluid flow through the resilient tubes is precluded.

4,450,863

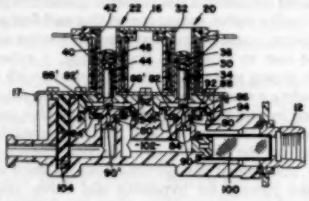
SERIES CONNECTED SOLENOID APPLIANCE CONTROL VALVE ASSEMBLY

Wade R. Brown, Saint Charles, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1981, Ser. No. 263,199

Int. Cl.³ F16K *31/02*

U.S. Cl. 137—613 **9 Claims**



1. An automatic dishwasher comprising:

(a) a water inlet line;

(b) a flow control valve assembly operatively connected with the water inlet line for controlling the water therethrough;

(c) wash water introducing means for introducing wash water into a container which is adapted to receive dishes, the wash water introducing means being operatively connected with the water inlet line downstream from the flow control valve assembly;

(d) electrical control means for selectively producing an electrical actuating potential on a control means output for controlling the flow control valve assembly such that water is selectively enabled to flow from the water inlet line to the water introducing means;

(e) the flow control valve assembly including first and second independently actuated pilot operated fluid valves connected fluidically in series such that the first and second fluid valves are each actuatable alone and independently to block the flow of fluid therethrough, the flow control valve assembly including:

(i) the first pilot operated fluid valve having a first valve seat and a first valve closure for selectively controlling fluid flow therethrough, the first valve closure defining a first pilot reservoir toward a side thereof opposite to the first valve seat, a first pilot inlet aperture for connecting the first pilot reservoir upstream of the first valve seat, a first pilot outlet aperture for connecting the first pilot reservoir downstream of the first valve seat, a first solenoid coil, and a first armature, the first armature being axially movable in the first solenoid coil and being operatively connected with the first pilot outlet aperture for selectively controlling fluid flow therethrough to control the relative position of the first valve closure and the first valve seat;

(ii) the second pilot operated fluid valve fluidically in series with the first pilot operated pilot valve, the second fluid valve including a second valve seat, a second valve closure for selectively controlling fluid flow through the second valve seat, the second valve closure defining a second pilot reservoir toward a side opposite the second valve seat, a second pilot inlet aperture for connecting the second pilot reservoir upstream of the second valve seat, a second pilot outlet aperture for connecting the second pilot reservoir downstream of the second valve seat, a second solenoid coil, and a second armature, the second armature being axially movable in the second solenoid coil and operatively interacting with the second pilot outlet aperture for selectively controlling fluid flow therethrough to control the relative position of the second valve closure and the second valve seat;

(iii) connecting means for connecting the first and second solenoid coils electrically in series across the electrical actuating potential at the control means output;

(iv) the series connected first and second solenoid coils having substantially the same electrical impedance as a pair of parallel connected solenoid coils, the first and second series connected solenoid coils each having substantially the same plural number of turns which plural number of turns is generally half the number of turns as a pair of parallel connected solenoid coils, and the first and second series connected solenoid coils each having an electrical resistance per unit length which is generally half the resistance per unit length of the parallel connected coils, whereby the serially connected first and second coils have generally half the number of turns and half the electrical resistance per unit length as the parallel connected coils, such that each series connected coil has generally a quarter of the resistance of a single parallel connected coil.

4,450,864

ELECTROPNEUMATIC VALVE CONTROL

Wilhelm Huckebrink, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,477

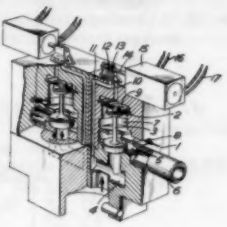
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108976

Int. Cl.³ F16K *31/126, 31/42*

U.S. Cl. 137—624.13 **2 Claims**

1. In an electropneumatic valve control device for use in milking installations, having first valve means including a valve body connected to one side of a diaphragm and movable between a first position and a second position in response to pressure changes on the other side of the diaphragm and electrically actuatable auxiliary valve means for changing the pressure on said other side of the diaphragm to shift the diaphragm and valve body from one of its positions to the other, the improvement wherein: the first valve means comprises a

diaphragm chamber at said other side of the diaphragm and a vacuum chamber connectable to a vacuum source during use to maintain a vacuum continuously therein and the auxiliary valve means comprises means forming a first connecting passage in communication with the vacuum chamber and thereby the vacuum therein and a second connecting passage in communication with the diaphragm chamber, a control slide valve body having a recess and movable between a rest position wherein the second connecting passage is connected to the atmosphere and the first connecting passage is sealed by the slide valve body with the vacuum in the first connecting passage acting on the slide valve body to retain same in place, and a working position wherein the recess in the slide valve body



connects the first connecting passage and the second passage and thereby the vacuum chamber to the diaphragm chamber with the vacuum acting on the slide valve body to retain same in place, and electromagnetic solenoid means responsive to an electrical pulse for briefly applying a force to the slide valve body to overcome the action of the vacuum thereon and move the slide valve body from the rest position to the working position wherein it is acted on by the vacuum to retain same in place and responsive to the next electrical pulse for briefly applying a force to the slide valve body to overcome the action of the vacuum thereon and move the slide valve body from the working position to the rest position wherein it is acted on by the vacuum to retain same in place until the next pulse.

4,450,865

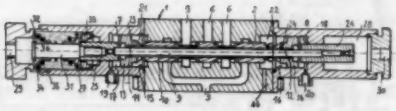
HYDRAULIC POWER SLIDE VALVE, ESPECIALLY DESIGNED FOR PUBLIC WORK EQUIPMENT

Maurice Tardy, St. Etienne, France, assignor to Bennes Marrel, Loire, France

Filed Jul. 28, 1980, Ser. No. 172,546

Int. Cl.³ F15B *13/042*

U.S. Cl. 137—625.6 **18 Claims**



9. In a hydraulic fluid valve utilizing a source of hydraulic fluid in a hydraulic system and having a valve body with one end and an opposite end, a valve bore through said valve body extending from said one end to said opposite end, at least one feed line passage and at least one discharge line passage extending from said valve bore, a connecting rod mounted within said valve bore of said valve body and including a first end extending beyond one end of said valve body and a second end extending beyond said opposite end of said valve body, slide valve means mounted to said connecting rod for controlling the flow of hydraulic fluid from said at least one feed line passage to said at least one discharge line passsage and movable independently of said connecting rod, and means for moving said connecting rod, the improvement wherein said means for moving said connecting rod comprises:

a first end cap member mounted to said one end of said valve body, said first end cap member having a first sealed cavity therein adjacent to said valve body, a second sealed cavity therein spaced a predetermined distance therefrom, and a reduced diameter passage interposed said first and second sealed cavities;

a first control piston member rigidly mounted to said first end of said connecting rod for movement therewith, said first control piston further being sealingly mounted in said reduced diameter passage of said first end cap member, said first control piston further forming a seal between said first and second sealed cavities and having one end portion extending into said first sealed cavity and an opposite end portion extending into said second sealed cavity of said first end cap member;

first biasing means for biasing said first control piston, said first biasing means being mounted in said second sealed cavity of said first end cap member;

a second end cap member mounted to said opposite end of said valve body, said second end cap member having a third sealed cavity therein adjacent to said valve body, a fourth sealed cavity therein spaced a predetermined distance therefrom, and a reduced diameter passage interposed said third and fourth sealed cavities;

a second control piston member rigidly mounted to said second end of said connecting rod for movement therewith, said second control piston being sealingly mounted in said reduced diameter passage of said second end cap member, said second control piston further forming a seal between said third and fourth sealed cavities and having one end portion extending into said third sealed cavity and an opposite end portion extending into said fourth sealed cavity of said second end cap member;

inlet passage means for said first and third sealed cavities interconnected with a source of pressurized fluid;

outlet passage means for said third sealed cavity of said second end cap member;

intermediate passage means interposed said connecting rod and said slide valve means for establishing fluid communication between said first sealed cavity of said first end cap member and said third sealed cavity of said second end cap member; and

valving means for terminating said fluid communication between said first sealed cavity of said first end cap member and said third sealed cavity of said second end cap member such that said connecting rod moves a predetermined distance to actuate said valving means to terminate communication between said first and third sealed cavities independently of said movement of said slide valve means.

4,450,866

DEVICE FOR CONTROLLING A FLOWTHROUGH CROSS SECTION IN A CONTROL LINE

Gerold Grimm, Leonberg; Ulrich Kemmner, Stuttgart; Heinrich Knapp, Leonberg, and Klaus Rose, Mundelsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 8, 1982, Ser. No. 338,410

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100514

Int. Cl.³ F16K *31/06*

U.S. Cl. 137—625.34 **7 Claims**

1. A housed device for controlling a flowthrough cross section in a control line carrying operating medium in an internal combustion engine, said device further having an electromagnetic actuation member and a valve device arranged to open said flowthrough cross section to a greater or lesser extent and axially adjustable by said actuation member counter to a restoring force, characterized in that said valve device is supported coaxially within said valve housing by means of two guide diaphragms having a circumference and held in place relative to one another by attachment to said housing at said circumference, and further including

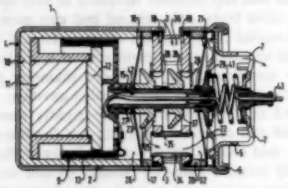
two similar, coupled valve members each of said valve

members arranged to cooperate with a valve seat, each valve member further including front and rear faces, wherein the front face of one valve member and the rear face of another valve member are subjected to a pressure which contacts one flow side of said valve members and the rear face of said one valve member and said front face of said other valve member is subjected to a pressure which contacts the other flow side of said valve members,

said valve members being connected with an actuation shaft of an electromagnetic system which is under control of said guide diaphragms and engaged by said actuation member,

said valve housing comprising a cuplike element having a bottom and said electromagnet system is disposed on said bottom of said valve housing,

each of said valve seats being supported on spaced apertured plate members in said valve housing,



said valve housing including a tubular wall section, said spaced apertured plate members supported in said tubular wall section and arranged to define an inner chamber, said chamber being in direct communication with said one flow side via inlet apertures in said tubular wall and said other valve member disposed in said chamber, and

said valve housing further including an end cap flanged thereto, said end cap arranged to compress a tensioning means against a portion of one of said guide diaphragms and a ring member which abuts one of said spaced apertured members, means connecting said spaced apertured plate members, and another of apertured plate members arranged to abut a second ring member to which urges a portion of the other of said guide diaphragms against a magnet housing of said electromagnet system.

4,450,867

DIVERTER VALVE AND ACTUATOR ASSEMBLY

James C. Moore, Rockwall, Tex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 8, 1982, Ser. No. 415,857
Int. Cl.³ F16K *11/00, 3/04*
U.S. Cl. 137—625.44 **10 Claims**

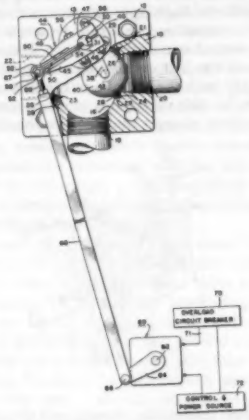
1. A diverter valve and actuator assembly for diverting the flow of a fluid from one path to another under the control of a power driven actuator, comprising:

(a) a valve body having a chamber therein closed by opposed side walls, and the valve body having an inlet port communicating with the chamber and having two outlet ports extending from the chamber through the body and each outlet port having a valve seat therearound where the port enters the chamber, and the body having shaft receiving bearings in its side walls;

(b) a valve shaft supported in the bearings and extending from outside the body into the chamber, and a valve member carried by the valve shaft and disposed to be mated selectively with either of said valve seats to close the adjacent outlet port by appropriate rotation of the valve shaft;

(c) an actuator having a power driven shaft carrying a pivot which reciprocates with respect to the valve shaft when the actuator is driven, and having a link member supported at one end by the pivot and having a second end; and

(d) a control arm assembly carried by the valve shaft and comprising two rigid arms extending from the valve shaft toward the second end of the link, resilient leaf spring means fixed with respect to the valve shaft and extending therefrom between the rigid arms and spaced therefrom



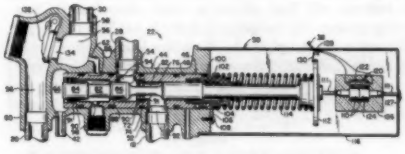
and terminating in an outer end, and means coupling the second end of the link with the outer end of the resilient leaf spring means, whereby as the actuator is driven the arm assembly rocks the valve shaft to selectively seat the valve member on one of the valve seats.

4,450,868

FREEZE PROTECTION APPARATUS FOR SOLAR COLLECTORS

Eugene F. Duval, 432B W. Meadow Dr., Palo Alto, Calif. 94306; David P. Bagshaw, 922 Lathrop Pl., Stanford, Calif. 94305; Michael A. Kast, 15 Bishop La., Menlo Park, Calif. 94025; Gilbert M. Masters, 1450 Mills Ct., Menlo Park, Calif. 94025, and Harry T. Whitehouse, 15 Bishop La., Menlo Park, Calif. 94025

Division of Ser. No. 960,399, Nov. 13, 1978, Pat. No. 4,280,478.
This application Apr. 30, 1981, Ser. No. 258,966
Int. Cl.³ F16K *11/06*
U.S. Cl. 137—625.29 **4 Claims**



1. Valve apparatus comprising:

a housing having a bore extending into the housing, a drain tube extending from said bore to the outside of said housing, a fluid duct extending from the exterior of the housing into the bore, and at least a first port and a second port formed to extend into the bore;

a body member exteriorly dimensioned to fit in the bore of the housing and removably inserted therein, the body member having a generally cylindrical elongate passage therethrough and at least a first orifice, a second orifice and a third orifice formed to extend into the passage, the first orifice and the second orifice being disposed so as to be aligned generally concentric with the first and second ports, respectively, and the third orifice being positioned so as to communicate with said duct;

an elongate valve member formed and configured to slidably fit in the passage, the valve member being axially translatable within the passage from a first position for communicating the first port and the first orifice to the second port and the second orifice to an intermediate position for communicating the first port and first orifice to the second port and the second orifice and the fluid duct simultaneously to pressurize the second port and the fluid duct using only fluid passages internal to the housing and from said intermediate position to a second position for interrupting communication between the first orifice and the second orifice and communicating the second port and the second orifice and the fluid duct to the drain tube via at least a portion of the passage; and

means for effecting axial translation of the valve member between the first and second positions.

4,450,869

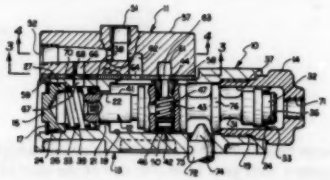
PILOT-OPERATED VALVE

Richard C. Acker, Cleveland, Ohio, assignor to Teledyne Republic Manufacturing, Cleveland, Ohio

Filed Jul. 24, 1981, Ser. No. 286,600

Int. Cl.³ F15B *13/042*

U.S. Cl. 137—625.48 **7 Claims**



1. A valve comprising an elongated housing assembly including a body formed of a material having poor wear resistance qualities and providing an elongated central passage therein, said passage providing a lateral opening therein intermediate its ends, a valve plate providing valve ports therein open to said passage mounted on said body and closing said lateral opening, said valve plate providing a valving surface exposed to said passage around said ports having good wear resistance properties, a slide reciprocable in said passage providing a central opening therein, balanced valve means carried by said slide engageable with said valving surface and operable to selectively connect said ports to said central opening in said slide, said slide being provided with surfaces providing good wear resistance properties, a plurality of resilient seals providing a fluidtight joint between said slide and said housing assembly, at least one of said seals being mounted on said body and fixed against movement relative thereto to prevent wear between said seal and said body, said one seal providing a dynamic seal with said slide, said slide being formed with substantial lateral clearance with respect to said central passage, said valve means operating without producing material lateral forces on said slide, said seals operating to center said slide in said passage and prevent contact between said slide and the walls of said passage to prevent wear in the walls of said passage and to permit continued operation of said valve when substantial amounts of contamination are present within said valve, a manifold block including a plurality of control ports and grooves open to one face of said block connecting at least some of said control ports, said manifold block being mounted along said one face against the side of said valve plate opposite said body so that said grooves connect said control ports to said valve ports, said manifold block including a inlet port connected to said central opening in said slide through passages formed in said manifold block, said valve plate and said body, and a single seal positioned within said valve plate providing a seal between said passages in said manifold block and said valve plate and said body, said manifold block being formed of material having poor wear resistance qualities and being free of contact with moving parts during the operation of said valve.

4,450,870

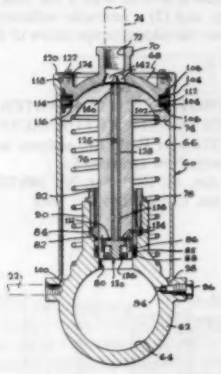
LIQUID SPRING ACCUMULATOR WITH SELF-CHARGING MEANS

Ralph L. Vick, Granada Hills, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 15, 1982, Ser. No. 357,968

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—31 **5 Claims**



1. A liquid spring accumulator with self-charging means including a high strength housing having inlet and return ports communicating with a source of operating liquid under high pressure, a high pressure chamber communicating with said source, a cylindrical chamber in said housing, a piston movable in said cylindrical chamber having one side communicating with said inlet port, resilient means urging said piston toward said inlet port and a rod in said cylindrical chamber of substantially smaller area than said piston attached to said piston and axially movable therewith into said pressure chamber;

characterized in that said accumulator includes an axial passage through said piston and rod connecting said inlet port with said high pressure chamber, a check valve in said passage, means holding said check valve open when said piston is nearest said inlet port, and a spring urging said check valve toward a closing direction, such that when said operating liquid is first supplied to said housing, said check valve permits said high pressure chamber to be filled, and when said operating liquid pressure reaches a predetermined level above the pressure at said return port, said piston initially moves to cause said check valve to be closed and further increases in said operating liquid pressure acting against said piston force said piston to carry said rod into said high pressure chamber.

4,450,871

HEAT-SHRINKABLE TUBES

Yasutoshi Sato, and Keiji Ueno, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 21, 1982, Ser. No. 370,635

Claims priority, application Japan, Apr. 21, 1981, 56-57488[U]

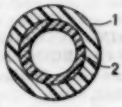
Int. Cl.³ F16L *9/14, 11/00*

U.S. Cl. 138—140 **6 Claims**

1. A heat-shrinkable tube comprising

a base layer of heat-shrinkable polymeric material in the form of a tube having an inner surface and an outer surface and

a layer of a composition on the inner surface of the tube, the composition comprising (1) a peroxide-curable acryl- or methacryl-modified epoxy resin, which is solid or semi-



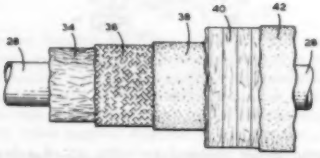
solid at temperatures of about 0 to 30° C. but soften or liquefy at temperatures at which the tube is subject to heat-shrinkage, and (2) a peroxide sufficient to cure said resin at the heat-shrinkage temperature of the tube.

4,450,872

FIBER PIPE PROTECTION FOR WATER COOLED PIPES IN REHEAT FURNACES

Donald R. Orcutt, Hanover Park, Ill., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 18, 1982, Ser. No. 389,722
Int. Cl.³ F27D *9/00, 3/02*
U.S. Cl. 138—149 **12 Claims**



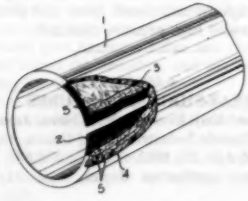
1. A refractory covering for application to a fluid conveying member comprising a thermal insulating ceramic fiber blanket layer disposed about and contacting the member; a cloth wrapped about the blanket, said cloth of an open weave type which permits penetration of a veneering mortar therethrough; and a layer of said veneering mortar applied to the cloth, said veneering mortar being dimensionally and chemically compatible with said cloth.

4,450,873

REINFORCED PLASTIC COMPOSITE STRUCTURE

Thomas H. Sadler, Morrison, and John J. Dalton, Littleton, both of Colo., assignors to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 753,973, Dec. 23, 1976, Pat. No. 4,171,238. This application May 29, 1979, Ser. No. 43,272
Int. Cl.³ F16L *9/04*
U.S. Cl. 138—174 **6 Claims**



1. In a reinforced plastic composite structure having a cured polymeric resin matrix which includes at least one layer of fibers, the improvement comprising:

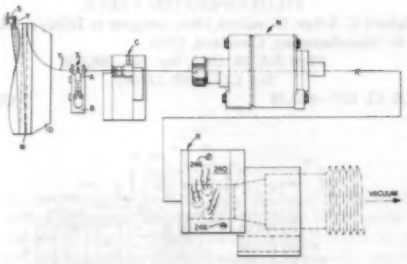
a particulate substance selected from the group consisting of portland cement, marble dust or mixtures thereof incorporated and dispersed throughout said resin matrix at least about 80% of said particulate substance having an equivalent spherical diameter in the range of about 10 to 70 microns.

4,450,874

YARN CLAMP

Charles W. Brouwer, Greenwich, R.I., and Larry C. Cowan, York, S.C., assignors to Leesona Corporation, Warwick, R.I.

Division of Ser. No. 223,203, Jan. 7, 1981, Pat. No. 4,362,189. This application Oct. 25, 1982, Ser. No. 436,463
Int. Cl.³ D03D *47/00*
U.S. Cl. 139—429 **8 Claims**



1. In combination with weft insertion means which is operative to propel weft yarn from one side of the shed of a loom to the opposite side thereof on signal while simultaneously being withdrawn from a supply of said weft yarn, the improvement comprising, anvil means over which the weft yarn is directed as said weft yarn is withdrawn from said supply, clamping means, first solenoid means for moving said clamping means in a first direction toward said anvil to pinch said weft yarn between clamping means and said anvil and thereby restrain said weft yarn from advance, second solenoid means spaced from said first solenoid means for moving said clamping means in a second direction to release said weft yarn from said clamping means, and armature means positioned between said first and second solenoid means, said armature means including a swingable portion initially engageable with one of said first and second solenoids upon energization of said solenoid, and a body portion engageable with said one of said solenoids after said swingable portion has been engaged thereby.

4,450,875

CONTROL DEVICE FOR THE NOZZLES OF A JET INSERTION POWER LOOM

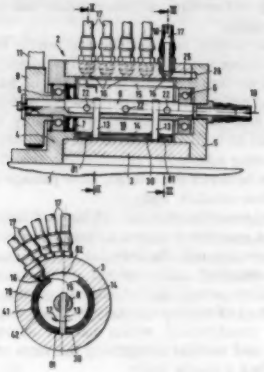
Dionizy Simson, Winterthur, and Hansjörg Walch, Seuzach, both of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 1, 1981, Ser. No. 307,618
Claims priority, application European Pat. Off., Oct. 2, 1980, 80 105967.6
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **13 Claims**

1. A control device for a plurality of weft-insertion nozzles in a jet power loom comprising

a stationary drum shaped reservoir having a plurality of circumferentially disposed outlets arranged in a helical manner for connection to the nozzles of a jet power loom; and

a cylindrical slide valve rotatably mounted in said reservoir, said valve having a slit extending over the entire length of



said valve and of a width greater than the circumferential distance between the axes of two adjacent outlets.

4,450,876

METHOD FOR WEAVING ON A WEAVING MACHINE OPERATING WITH A BLOWING NOZZLE FOR A FLOWING TRANSPORT FLUID

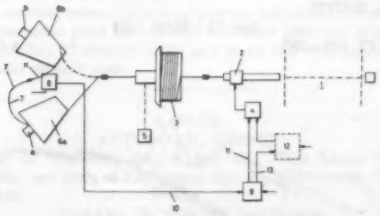
Hubert P. van Mullekom, Deurne, Netherlands, assignor to Ruti-te Strake B.V., Netherlands

Filed Jun. 22, 1982, Ser. No. 390,850

Claims priority, application Netherlands, Jul. 2, 1981, 8103184

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 3 Claims



1. A method for weaving on a weaving machine operating with a blowing nozzle for a flowing transport fluid, in which weft threads are measured and withdrawn from successive yarn packets, characterized in that the switching to a next yarn packet is combined with a temporary change in the feed pressure of the blowing nozzle.

4,450,877

PHARMACEUTICAL PREPARATIONS IN SOLID UNIT DOSAGE FORM

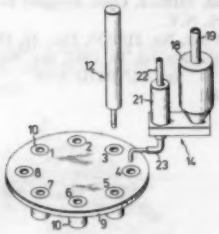
Stephen E. Walker, Buckingham; Keith Bedford, Newport Pagnell, and Terence Eaves, Woburn Sands, all of England, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 210,219, Nov. 25, 1980, which is a continuation of Ser. No. 956,448, Nov. 1, 1978, abandoned. This application Sep. 8, 1982, Ser. No. 416,046

Claims priority, application United Kingdom, Nov. 3, 1977, 45755/77

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1 12 Claims



1. A process for the manufacture of a pharmaceutical preparation in unit dosage form, which comprises the steps of preparing a liquid carrier containing an active ingredient and a liquid which solidifies or gels sufficiently to lose its liquid flow properties said liquid carrier being a thixotropic gelling agent, and dosing said liquid carrier containing the active ingredient in its liquid form into a rigid shell suitable for administration as a dosage unit.

4,450,878

APPARATUS FOR FILLING A HIGH TEMPERATURE LIQUID INTO A BIAXIALLY ORIENTED, SATURATED POLYESTER BOTTLE, A DEVICE FOR COOLING SAID BOTTLE

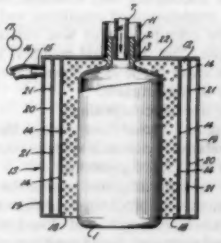
Takuzo Takada; Hiroaki Sugirua, and Takao Iizuka, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 65,505

Claims priority, application Japan, Aug. 12, 1978, 53-98321; Sep. 6, 1978, 53-122323[U]; Sep. 6, 1978, 53-122324[U]; Sep. 14, 1978, 53-113077; Sep. 27, 1978, 53-132533[U]

Int. Cl.³ B65B *31/00*

U.S. Cl. 141—48 2 Claims



1. An apparatus for filling a high temperature liquid 6 into a series of polyethylene terephthalate bottles 1 progressively fed into predetermined positions, said apparatus comprising an injection tube 7 adapted for relative downward movement into the neck 2 of a bottle 1 positioned stationarily at a predeter-

mined position to pour a high temperature liquid **6** into said bottle **1**; a vertically movable cylindrical seal cover **11** provided coaxially about said injection tube **7** and having a somewhat greater inside diameter than the outside diameter of said neck **2**; and a housing **13** secured to the outside of said cylindrical seal cover **11** at the lower end thereof to define with said cylindrical seal cover **11** is cooling fluid chamber **12** having a closed upper end and an open lower end forming an outlet opening **14**, said housing **13** having at its upper end an inlet opening **15** through which to communicate said chamber **12** with one end of a cooling fluid supply pipe **16**.

4,450,879

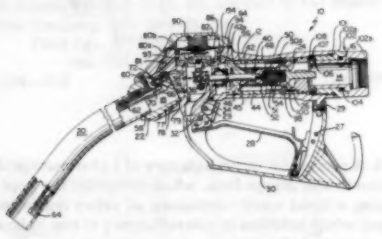
MODULAR FLUID DISPENSING NOZZLE

Chester W. Wood, Milford, Ohio, assignor to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 218,634, Dec. 22, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,691

Int. Cl.³ B67D *5/04*

U.S. Cl. 141—209 **38 Claims**



1. A dispensing nozzle with an automatic shut-off mechanism, comprising:

(a) a nozzle body having an internal flow passage;

(b) a valve disposed in said internal flow passage for selectively blocking flow therethrough, said valve being movable between an open position in which fluid flow through the internal flow passage is permitted and a closed position in which fluid flow through the internal flow passage is substantially blocked;

(c) an actuator for moving the valve between open and closed positions under predetermined conditions;

(d) means for moving the valve to the closed position irrespective of the position of the actuator under other predetermined conditions, said moving means including:

(i) a plurality of independently rotatable members;

(ii) means for coupling said independently rotatable members for common rotational movement in response to movement of said actuator;

(iii) means for uncoupling said rotatable members in response to a predetermined condition; and

(iiii) means for rotating one of said rotatable members relative to the other when said members are uncoupled to move the valve to the closed position irrespective of the position of the actuator.

20. A dispensing nozzle, comprising:

(a) a body having an internal flow passage therethrough;

(b) an actuator relatively movable with respect to said body between open and closed positions;

(c) valve means movably disposed within the internal flow passage for selectively blocking fluid flow therethrough, said valve means having open and closed positions corresponding to said open and closed positions of said actuator and being responsive to and under control of said actuator under predetermined conditions; and

(d) means for releasing said valve means from said control of said actuator in response to predetermined conditions; said releasing means being at least contained within a cartridge for common removal with the cartridge from the body.

27. A fluid dispensing nozzle, comprising:

(a) a nozzle body having an internal flow passage;

(b) a swivel connector for providing a sealed and rotatable connection between the internal flow passage in the nozzle body and an external flow conduit, said swivel connector including:

(i) a base portion received by said nozzle body and communicating with said internal flow passage; and

(ii) a tail portion rotatably secured to said base portion and extending into said internal flow passage to form a valve seat, said tail portion being rotatably movable with respect to both said nozzle body and said base portion and being adapted to provide selective fluid communication between the internal flow passage and the external flow conduit; and

(c) a valve movably disposed within said internal flow passage and movable between a first open position in which fluid flow through the internal flow passage is substantially unblocked and a second seated position in which said valve is seated against said tail portion.

34. A method of making an easily serviced dispensing nozzle of modular construction which has an automatic shut-off mechanism, said method comprising the steps of:

(a) providing a nozzle body;

(b) forming an internal flow passage through said body;

(c) supporting an actuator on said body which is relatively movable with respect to said body between open and closed positions;

disposing movable valve means within said internal flow passage for selectively blocking fluid flow therethrough, said valve means having open and closed positions corresponding to said open and closed positions of said actuator and being responsive to and under control of said actuator under predetermined conditions;

(e) providing means for releasing said valve means from said control of said actuator in response to predetermined conditions;

(f) providing a cartridge which is readily installed in and removed from said body;

(g) disposing said releasing means within said cartridge; and

(h) disposing said cartridge with said releasing means therein within said body;

said cartridge being adapted to be easily replaced by a relatively unskilled service station attendant using simple tools to thereby provide said nozle having easily serviced releasing means.

4,450,880

FILLER PIPE FOR A FUEL TANK

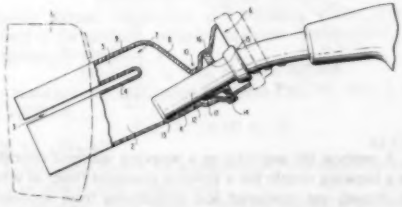
Dieter Scheurenbrand, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 218,680, Dec. 22, 1980, abandoned. This application Jan. 17, 1983, Ser. No. 458,532

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952175

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—285 **8 Claims**



1. A one-piece filler arrangement for motor vehicle fue tanks comprising a filler pipe having an upper wall and an inlet

opening, vent pipe means formed as apart of the upper wall for venting air from the fuel tank with one end of the vent pipe means terminating at a distance from the inlet opening, sloping baffle means formed from a drawn-in wall part of the upper wall of the filler pipe between the inlet opening of the filler pipe and the one end of the vent pipe, shaped means projecting generally inwardly between the inlet opening and the one end of the vent pipe for supporting a fuel nozzle, said shaped means being formed in part with said drawn-in wall part, wherein the direction of insertion of the fuel nozzle is controlled by the shaped means and direct flow of fuel from the fuel nozzle into the vent pipe is precluded.

4,450,881

ROLLER TABLE FOR WOODWORKING MACHINES

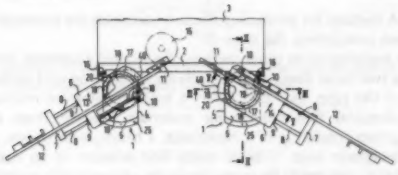
Kurt Buttner, Oberkochen, Fed. Rep. of Germany, assignor to Okoma Maschinenfabrik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 217,924, Dec. 18, 1980, abandoned. This application Jul. 8, 1983, Ser. No. 511,721

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951355

Int. Cl.³ B27F *5/00*

U.S. Cl. 144—84 **15 Claims**



1. In a roller table for a woodworking machine having:
(i) a rolling unit for rolling along a straight guideway of the machine,
(ii) a pivot member on said rolling unit having an axis,
(iii) a table plate engaged on said pivot member and rotatable with respect to said rolling unit about said axis,
(iv) a supporting bar, for supporting an overhanging end of a workpiece, engaged slidably with said table plate for longitudinal movement radially with respect to said axis,
the improvement which comprises:
(a) said rolling unit having a support plate carrying said pivot member, said support plate having an upper first support surface about said axis,
(b) said table plate extending radially beyond said first support surface and including means defining a recess,
(c) said pivot member being rotatably engaged in said recess,
(d) said table plate extending over said first support surface,
(e) said support plate having an upper second support surface spaced radially from said first support surface and abutted by said table plate, and
(f) securing means for acting between said support plate and said table plate for securing said table plate in a selected position of rotation about said pivot axis with respect to said support plate.

4,450,882

AUTOMATIC SHAPER

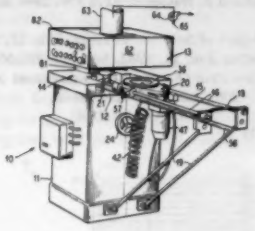
Lonnie G. Hitchcock, Rte. 2, Box 60C, Rock Island, Tenn. 38581, and Richard J. Flanigan, Rte. 12, McMinnville, Tenn. 37110

Filed Oct. 14, 1981, Ser. No. 311,428

Int. Cl.³ B27C *5/00*; B23C *3/04*; B23Q *35/00*

U.S. Cl. 144—145 A **4 Claims**

3. An automated machine tool having a cutter head, a pattern stop adjacent said head, a work support chuck detachably mounting a pattern and a workpiece, a pneumatic jack with a piston rod selectively clamped to the chuck for biasing the chuck to hold the pattern against the stop, means for rotating the chuck to feed the workpiece to the cutter, and control means for automatically actuating the jack and the means for rotating the chuck through a cycle feeding the workpiece to



the cutter head under a controlled load at a selected feed rate and retracting the workpiece from the cutter upon completion of the cutting cycle.

4,450,883

HINGE JOINT FOR HOLLOW PANELS FOR COVERING SWIMMING POOLS OR THE LIKE

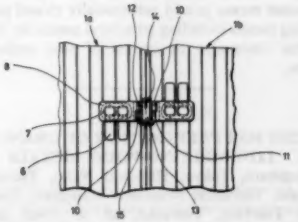
Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,723

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103925

Int. Cl.³ E05D *5/06*

U.S. Cl. 160—229 R **9 Claims**



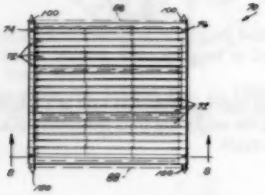
1. A hinge joint for joining hollow panels for use particularly for covering swimming pools, each hollow panel including a top cover wall and a bottom cover wall parallel to the top wall, and a plurality of longitudinal parallel ribs extending between the bottom and the top cover walls to form therebetween a plurality of closed cavities, each said cover wall having an outer side and an inner side facing said cavities, respective said cover walls of the hollow panels to be joined being each formed with at least one bore, the hinge joint comprising two connecting parts receiving a hinge pin to join them together, each connecting part including at least one supporting bar inserted through said bore into a respective one of said cavities and hooked therein, and a flange intergral with said supporting bar and resting against the outer side of the respective cover wall so as to completely cover said bore and seal it off, wherein said supporting bar is angularly shaped and has an elongated portion which extends normal to said flange when the supporting bar is hooked into said one of said cavities.

4,450,884

SURFACE DEFINING SLATS AND ARTICLES UTILIZING SAME

Clayton J. Hemmerle, 116 NE. 16th Ct., Ft. Lauderdale, Fla. 33305, and Richard A. Basinger, 6318 SW. 26th St., Miramar, Fla. 33023

Continuation-in-part of Ser. No. 352,102, Feb. 25, 1982. This application Jun. 21, 1982, Ser. No. 390,661
The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.
Int. Cl.³ E06B 3/30
U.S. Cl. 160—371 10 Claims



1. A slat adapted to being securely positioned between opposing support members capable of defining at least one surface when a plurality of slats are positioned therebetween, said slat comprising:

surface defining means including top and bottom surfaces for defining a portion of said at least one surface and having a predetermined interior transverse dimension, said surface defining means having two generally opposing ends, each of said ends including attachment means defining a substantially closed cavity for receiving a portion of one of said support members;

biasing means for providing a bias force and thereby biasing said attachment means to a normal substantially closed position and for allowing access to said cavity upon application of a force in a direction generally opposing said bias force; and

locking means for securely yet removably locking said attachment means in said substantially closed position, said locking means including structural means for reducing the interior transverse dimension of said surface defining means.

4,450,885

PROCESS FOR PREPARATION OF GRANULES OF LOW-MELTING-POINT METALS

Yujiro Sugahara, Tokyo; Hiroyuki Naito, Tsuruoka; Akira Takahashi, Tsuruoka; Manshiro Hasegawa, Tsuruoka, and Hisashi Tsuchida, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1978, Ser. No. 958,486
Claims priority, application Japan, Nov. 12, 1977, 52-135907
Int. Cl.³ B22D 23/08
U.S. Cl. 164—47 4 Claims

1. A process for the preparation of granules of low-melting-point metals which comprises

(I) spouting a melt of a low-melting-point metal at a temperature 50° to 100° C. higher than the melting point of said metal in the form of fine streams through extrusion nozzle openings into a gas atmosphere,

(II) vibrating the extrusion nozzle openings in a direction parallel to the spouting direction under melt fracture-causing conditions such that the molten metal is spouted in continuous streams comprising large-diameter and small-diameter portions appearing alternatively, and

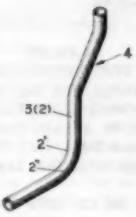
(III) allowing the fine streams of the molten metal to fall into a collecting cooling liquid at a speed of 50 to 300 cm/sec at the position just above the surface of said collecting liquid thereby to rectify the shape of the drops to a substantially spherical shape and to cool the drops.

4,450,886

METHOD OF PRODUCING SUCTION MANIFOLDS FOR AUTOMOBILE ENGINES

Michitoshi Enomoto, and Yasuo Shimizu, both of Osaka, Japan, assignors to Nakamura Kinzoku Kogyosho, Inc., Osaka, Japan

Continuation of Ser. No. 168,603, Jul. 14, 1980, abandoned. This application Dec. 13, 1982, Ser. No. 449,120
Int. Cl.³ B22D 19/00
U.S. Cl. 164—75 6 Claims



1. A method for producing suction manifolds for automobile engines comprising the steps of:

(a) applying to an outer surface of a curved aluminum pipe, a two layer film, by first applying directly on said surface of the pipe, as a first layer, a high-temperature resistant chemical film comprising materials selected from the group consisting of a phosphate, a halide, a chromate, an inorganic base, a metal oxide fine powder or an easily oxidizable metal fine powder, in the presence of a reaction accelerator selected from the group consisting of hydrofluoric acid or phosphoric acid, and then applying on the surface of the first layer, as a second layer, a lubricating film comprising materials selected from the group consisting of fatty acids and salts thereof, oils, fats, condensation polymerization compounds, graphite, carbon black, molybdenum bisulfide or boron nitride; and

(b) placing said coated pipe onto a mold having a cavity shaped to define a manifold and then pouring molten aluminum into the mold to form a manifold wherein, after casting is completed, said curved aluminum pipe functions as an exhaust gas recirculating passage.

4,450,887

DIRECT CHILL CASTING APPARATUS

Rennie F. T. Wilkins, Chigwell, England, assignor to The British Aluminium Company Limited, England

Division of Ser. No. 12,765, Feb. 16, 1979, Pat. No. 4,355,679. This application Dec. 1, 1981, Ser. No. 326,307
Claims priority, application United Kingdom, Feb. 18, 1978, 6527/78
Int. Cl.³ B22D 11/04, 11/16
U.S. Cl. 164—154 14 Claims

1. Apparatus for the direct chill casting of non-ferrous metals comprising

a water cooled open mould having its axis vertical,

an inner surface of the mould,

a rigid sleeve of thermally insulating material of a size and shape to be a clearance fit within the inner surface of the mould,

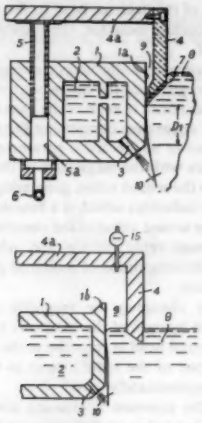
support means for locating the sleeve in register with the upstream end of the inner surface,

drive means operable during a casting operation for relatively axially moving the mould and the sleeve to vary the axial length of the inner surface overlapped by the sleeve,

a gap between the sleeve and the inner surface,

means for maintaining a pool of liquid metal within the mould during a casting operation with a peripheral zone of the pool in contact with the inner surface, and

pressure means associated with the sleeve and operable during a casting operation to vary the downward pressure



applied to the zone in order to vary the axial length of the inner surface contacted by liquid metal.

4,450,888

MOULDING PLANT

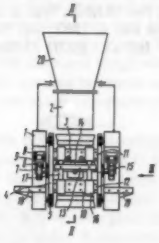
Dmitry A. Shibanov; Inokenty A. Onufriev; Vladimir A. Khristov, and Evgeny A. Sergeev, all of Moscow, U.S.S.R., assignors to NPO "Vilitmash", Moscow, U.S.S.R.

PCT No. PCT/SU80/00018, 371 Date Sep. 28, 1981, 102(e) Date Sep. 28, 1981, PCT Pub. No. WO81/02122, PCT Pub. Date Aug. 6, 1981

PCT Filed Feb. 1, 1980, Ser. No. 308,539

Int. Cl.³ B22C *15/06, 15/20*

U.S. Cl. 164—183 **12 Claims**



1. A moulding plant comprising:

a sandslinger;

a turnover and withdrawal apparatus having a turnover mechanism and a pattern withdrawal mechanism, said turnover mechanism being made in the form of two disks spaced apart and coaxially mounted on rollers, which disks are connected with a drive designed to turn the turnover and withdrawal apparatus in a vertical plane about the horizontal axis of the disks, two roller conveyors mounted on crossmembers installed between the disks being located between said disks in symmetry with their horizontal axis and parallel thereto, said pattern withdrawal mechanism incorporated power cylinders disposed on the crossmembers between the turnover mechanism disks for the purpose of withdrawing patterns together with a pattern plate, wherein the sandslinger is located over the turnover and withdrawal apparatus with the possibility for horizontal reciprocating movement, the turnover and withdrawal apparatus being provided with a double-sided pattern plate both sides of which are designed for attachment of patterns for cope and drag moulding boxes carried by top and bottom roller conveyers respectively, said double-sided pattern plate being mounted for rotation together with the turnover and withdrawal apparatus and for vertical movement between the cope and drag moulding boxes in order to withdraw the pattern from the completed half-mould in one of the moulding boxes simultaneously with assembling the other moulding box with the respective pattern.

4,450,889

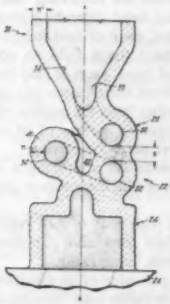
MOLD HAVING A HELIX FOR CASTING SINGLE CRYSTAL ARTICLES

Arnold S. Grot, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 20, 1982, Ser. No. 409,785

Int. Cl.³ B22C *9/04*

U.S. Cl. 164—361 **5 Claims**



1. A mold made of layered ceramic shell material, for containing molten metal during directional solidification of a single crystal article casting, wherein a solidification interface is caused to move progressively through the molten metal, comprised of

(a) a starter section, for containing a portion of the molten metal in which a solidification interface is first initiated;

(b) an article section, shaped to define the desired single crystal article; and

(c) a selector section, connecting the starter section with the article section, for causing the solidification interface progressing from the starter section toward the article section to have the desired single crystal characteristic, the selector section containing a passage shaped as a helix having more than one turn, the helix lying along an axis and having a lead which provides a separation between adjacent turns of the passage that is more than one half but less than two times the thickness of the ceramic shell material defining the helix, as thickness is measured along the radius normal to the said axis at an outermost diameter of a turn of the passage, the layered ceramic shell material joining adjacent turns of the passageway at the outside diameter of the passageway.

4,450,890

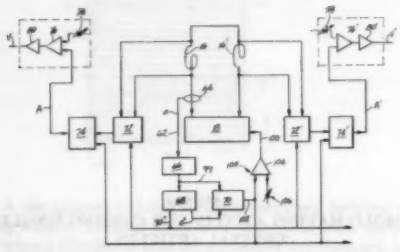
PROCESS AND APPARATUS FOR ELECTROMAGNETIC CASTING OF MULTIPLE STRANDS HAVING INDIVIDUAL HEAD CONTROL

John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge; Peter J. Kindlmann, Guilford, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 236,386, Feb. 20, 1981, abandoned. This application Aug. 19, 1981, Ser. No. 294,262

Int. Cl.³ B22D *27/02, 11/01*

U.S. Cl. 164—452 **16 Claims**



1. An electromagnetic multi-strand casting apparatus for casting molten materials into at least two ingots of desired shape comprising:

at least two inductors connected in series, each forming a containment zone for receiving and forming a separate molten material head extending above a corresponding solidifying ingot, each of said inductors applying a magnetic containment force field to contain its respective molten material head, each of said inductors in operation being spaced from their respective molten material head by a gap extending from the surface of the molten material head to the opposing surface of its corresponding inductor, the improvement comprising:

power supply means for supplying a common alternating current to each of said inductors to generate said magnetic force fields;

means associated with each of said inductors for minimizing variations in their respective gap during operation of the casting apparatus, comprising:

means for sensing a value of an electrical parameter of said inductors which varies with the magnitude of their respective gap;

means responsive to the sensing means for generating an error corresponding to each of said inductors which is a function of the difference between the sensed value of said electrical parameter and a predetermined value thereof and which corresponds to the magnitude of a desired gap associated with each inductor;

means associated with each of said inductors for independently changing the magnetic containment force field applied to said molten material head in response to its corresponding error signal so as to drive this error signal to approximately zero; and

feedback control means operatively associated with said minimizing variation means for regulating said power supply means to maintain said common alternating current at a substantially constant value so that changes in the containment force field generated by one of said inductors does not substantially effect the containment force field generated by another of said inductors.

11. In a process for casting molten materials into at least two ingots of desired shape, comprising the steps of:

providing at least two inductors connected in series, each of said at least two inductors forming a containment zone for receiving and forming a separate molten material head extending above a corresponding solidifying ingot, each of said inductors applying a magnetic containment force field to contain its respective molten material head, each of said inductors in operation being spaced from their respective molten material head by a gap extending from the surface of the material head to the opposing surface of its corresponding inductor, the improvement comprising the steps of:

supplying a common alternating current to each of said inductors to generate the magnetic force fields;

minimizing variations in each of the gaps during operation of the casting apparatus, comprising the steps of:

sensing a value of an electrical parameter of said inductors which varies with the magnitude of their respective gaps;

in response to the sensed value, generating an error signal for each of the inductors which is a function of the difference between the sensed value of the electrical parameter and a predetermined value thereof and which further corresponds to the magnitude of a desired gap associated with each inductor;

independently changing the magnetic containment force field applied by each of the inductors to its corresponding molten material head in response to the error signal associated with one of the inductors so as to drive that error signal to approximately zero;

maintaining the common alternating current at a substantially constant value so that changes in the containment force field generated by one of the inductors does not substantially effect the containment force field generated by another of the at least two inductors.

4,450,891

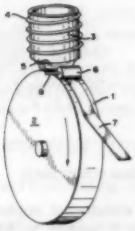
METHOD OF AND APPARATUS FOR CONTINUOUS CASTING USING AN AUXILIARY GRAPHITE CHILL ROLL

Reed H. Belden, Bernardsville; Hsin L. Li, Parsippany, and Dulari L. Sawheny, Denville, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 183,520, Sep. 2, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,176

Int. Cl.³ B22D *11/06*

U.S. Cl. 164—463 **7 Claims**



1. In an apparatus for the production of solid metal strip from a molten source including a rapidly moving quench surface and means for impinging the molten metal onto the quench surface to form the solid metal strip, the improvement which comprises an auxiliary, liquid-cooled chill roll consisting essentially of graphite for contacting the solid strip and urging it against the quench surface.

6. In a method for the production of solid metal strip by impinging molten metal onto a rapidly moving quench surface, the improvement which comprises cooling the strip just after it solidifies by pressing it against the quench surface with a liquid-cooled chill roll consisting essentially of graphite.

4,450,892

METHOD AND APPARATUS FOR CONTINUOUS CASTING OF METALLIC STRANDS IN A CLOSED POURING SYSTEM

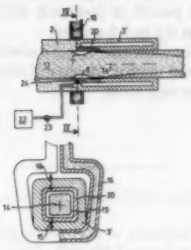
Wilfried Heinemann, Richterswil, Switzerland, and Theodor Rummel, Grünwald/München, Fed. Rep. of Germany, assignors to Concast, A.G., Zurich, Switzerland

Filed Jun. 29, 1981, Ser. No. 278,414

Claims priority, application Switzerland, Jul. 11, 1980, 5347/80

Int. Cl.³ B22D 11/00, 11/10

U.S. Cl. 164—467 13 Claims



1. A method of continuous casting of metals into a cast strand in a closed pouring system, comprising the steps of:

providing a refractory distributor vessel-pouring structure having an outlet opening;

providing a continuous casting mold having a mold inlet opening bounded by a wall and operatively connected with the distributor-vessel pouring structure, a lengthwise axis which is approximately horizontally disposed and a hollow mold compartment contained in said continuous casting mold;

casting metal through the distributor vessel-pouring structure into the continuous casting mold;

providing an electromagnetic means comprising an electromagnetic coil and arranging said electromagnetic coil such that the spacing between said electromagnetic coil and the hollow mold compartment below the approximately horizontally disposed lengthwise axis of the mold is smaller than the spacing between said electromagnetic coil and the hollow mold compartment above said mold lengthwise axis;

generating by means of said electromagnetic coil a metal-constricting electromagnetic field at the region of a connection plane of the distributor vessel-pouring structure and the continuous casting mold; and

said constricting electromagnetic field being effective upon the molten metal in order to maintain the molten metal away from the wall of the mold inlet opening.

7. An apparatus for continuous casting of metals with a closed pouring system, comprising:

a refractory vessel-pouring structure;

a cooled continuous casting mold having a lengthwise axis which is approximately horizontally disposed operatively connected with said refractory vessel-pouring structure at a connection plane;

electromagnetic means comprising an electromagnetic coil arranged at the region of said connection plane between said vessel-pouring structure and said continuous casting mold for constricting the molten metal which is being cast;

said continuous casting mold containing a hollow mold compartment; and

said electromagnetic coil being arranged such that the spacing between said electromagnetic coil and the hollow mold compartment below the approximately horizontally disposed lengthwise axis of the mold is smaller than the spacing between said electromagnetic coil and the hollow mold compartment above said mold lengthwise axis.

4,450,893

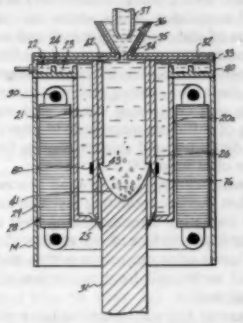
METHOD AND APPARATUS FOR CASTING METALS AND ALLOYS

Joseph Winter, New Haven; Derek E. Tyler, Cheshire, and Jonathan A. Dantzig, Hamden, all of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,232

Int. Cl.³ B22D 27/02

U.S. Cl. 164—468 11 Claims



1. In an apparatus for continuously or semi-continuously forming a semi-solid thixotropic alloy slurry, said slurry comprising throughout its cross section degenerate dendrite primary solid particles in a surrounding matrix of molten metal, said apparatus comprising:

means for containing molten metal including a mold wall for containing and extracting heat from said thixotropic slurry, said containing means having a desired cross section;

means for controllably cooling said molten metal in said containing means; and

means for mixing said molten metal for shearing dendrites formed in a solidification zone as said molten metal is cooled for forming said slurry;

said mixing means comprising a single two pole stator for generating a non-zero rotating magnetic field which moves transversely of a longitudinal axis of said containing means across the entirety of said cross section of said containing means and over said entire solidification zone, said moving magnetic field providing a magnetomotive stirring force directed tangentially of said containing means for causing said molten metal and slurry to rotate in said containing means, said magnetic force being of sufficient magnitude to provide said shearing of said dendrites, said magnetomotive force providing a shear rate of al least 500 sec. $^{-1}$;

the improvement wherein said apparatus comprises

a first insulating layer extending over at least a portion of the inside surface of said mold wall and terminating at a lower edge projection within said mold wall,

means for cooling said mold wall arranged about on outside surface of said mold wall; and

a second insulating layer located along a specific length of the outside surface of said mold wall, said specific length beginning approximately at said lower edge projection of said first insulating layer and extending a predetermined distance below said projection, said second layer comprising a coating serving to alter the thermal characteristics of said mold wall along said length as compared to the remainder of said liner.

7. In a process for continuously or semi-continuously form-

ing a semi-solid thixotropic alloy slurry, said slurry comprising throughout its cross section degenerate dendrite primary solid particles in a surrounding matrix of molten metal, said process comprising:

providing a means for containing molten metal having a desired cross section, said means including a mold wall for containing and extracting heat from said thixotropic slurry;

controllably cooling said molten metal in said containing means; and,

mixing said contained molten metal for shearing dendrites formed in a solidification zone as said molten metal is cooled for forming said slurry;

generating solely with a two pole stator a non-zero rotating magnetic field which moves transversely of a longitudinal axis of said containing means across the entirety of said cross section of said containing means and over said entire solidification zone, said moving magnetic field providing a magnetomotive stirring force directed tangentially of said containing means for causing said molten metal and slurry to rotate in said containing means, said magnetomotive force being of sufficient magnitude to provide said shearing of said dendrites, said magnetomotive force providing a shear rate of at least 500 sec. $^{-1}$;

the improvement wherein said forming process comprises

placing a first thermal insulating layer on said mold wall, said first insulating layer extending over at least a portion of the inside surface of said mold wall and terminating at a lower edge projection within said mold wall;

cooling said mold wall from an outside surface of said mold wall; and

coating a second thermal insulating layer along a specific length of the outside surface of said mold wall, said specific length beginning approximately at said lower edge projection of said first insulating layer and extending a predetermined distance below said projection, said second coated layer serving to alter the thermal characteristics of said mold wall along said length as compared to the remainder of said mold wall.

4,450,894

METHOD FOR HORIZONTAL TYPE CONTINUOUS CASTING

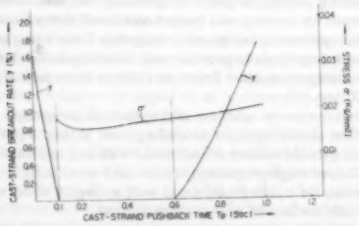
Kiyomi Taguchi; Masayuki Hanmyo, and Masaru Ishikawa, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 328,409, Dec. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 160,079, Jun. 16, 1980, abandoned. This application Jun. 13, 1983, Ser. No. 503,074

Claims priority, application Japan, Jul. 10, 1979, 54-86495

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—484 **1 Claim**



1. A method for horizontal type continuous steel casting, which comprises:

withdrawing a cast steel strand from a copper mold provided horizontally at the lower part of a tundish at a prescribed withdrawing speed for a prescribed period of withdrawing time; then, pushing back said cast steel strand for a prescribed period of pushback time in the direction opposite to the direction of withdrawal; and, withdrawing said cast steel strand again from said mold at said prescribed withdrawing speed for said prescribed period of withdrawing time; repeating said withdrawal and said pushing back, the distance of said withdrawal being longer than that of said pushing back; thereby intermittently withdrawing said cast steel strand from said mold;

said method being characterized by comprising:

said prescribed withdrawing speed being within the range of from 1.0 to 10.0 m/minute;

said prescribed period of withdrawing time being within the range of from 0.5 to 1.5 second; and,

said prescribed period of pushback time being within the range of from 0.1 to 0.6 second;

thereby preventing a breakout and a crack from occurring in the trailing end portion of the solidified shell of the cast steel strand in said mold.

4,450,895

PROCESS AND APPARATUS FOR HEATING OR COOLING LIGHT SOLID PARTICLES

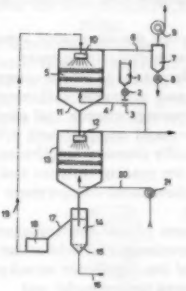
Georges Meunier, Boulogne, France, and Maurice A. Bergougnou, London, Canada, assignors to Tunzini-Nessi Enterprises D'Equipements, Argenteuil, France

Filed Nov. 2, 1981, Ser. No. 317,326

Claims priority, application France, Nov. 5, 1980, 80 23570

Int. Cl.³ F28D *19/02*

U.S. Cl. 165—1 **18 Claims**



1. A process for the heat transfer treatment of light solid particles having a low free-fall speed which comprises:

(a) dispersing the light particles in a first gas current;

(b) contacting the first gas current, containing the light particles and moving upward along a first baffled path in a reaction zone, with heavy solid particles having a greater free-fall speed and circulating countercurrently in the reaction zone in a loose gravity flow, to effect a first heat transfer between the light particles in the first gas current and the heavy particles;

(c) contacting the heavy particles, having undergone the first heat transfer and circulating countercurrently along a second baffled path in a loose gravity flow, with an upward-moving second gas current, to effect a second heat transfer between the heavy particles and the second gas current;

(d) recycling the heavy particles and

(e) reusing the heavy particles in step (b).

4,450,896

METHOD AND APPARATUS FOR HEAT EXCHANGE AT SOLID SURFACES

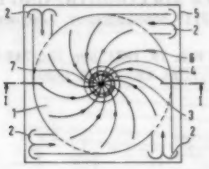
Heinrich Opitz, Erlangen; Bernhard Montag, Forchheim; Gerd Urban, Erlangen, and Wilfried Türk, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,437

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137034

Int. Cl.³ F28F *13/02*

U.S. Cl. 165—1 23 Claims



1. A method for conducting heat from a solid surface, comprising the steps of:

feeding a fluid coolant into a flow chamber through at least one flow inlet, said flow chamber being in thermal contact with said solid surface;

moving said coolant along a substantially spiral path in said flow chamber from said inlet to at least one flow outlet; and

controlling the velocity of said coolant along said spiral path to produce a predetermined boundary layer thickness distribution along said path, thereby controlling the rate at which heat is transferred at various points on the portion of said solid surface in thermal contact with said flow chamber.

4,450,897

AIR-CONDITIONING METHOD AND SYSTEM FOR AN AUTOMOTIVE VEHICLE

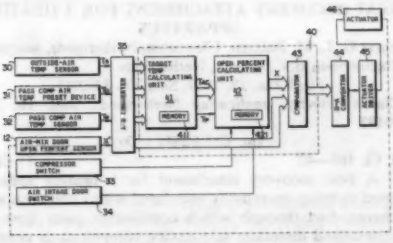
Tetsuya Iijima, Yamato, and Seiichi Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 3, 1981, Ser. No. 317,861

Claims priority, application Japan, Nov. 4, 1980, 55-153717

Int. Cl.³ G05D *23/00*; B60H *3/00*; F25B *29/00*

U.S. Cl. 165—2 12 Claims



1. An air conditioning method for an automotive vehicle air conditioning system in which the temperature of air outputted into a passenger compartment is controlled by the opening percentage of an air mix door, which comprises the following steps of:

(a) detecting air temperature at a plurality of locations, including at least outside air temperature T_A and passenger compartment air temperature T_P;

(b) determining a desired passenger compartment air temperature T_O preset by a passenger compartment air temperature preset device;

(c) calculating a required target outlet duct air temperature T_{AC} as a function of outside air temperature T_A, passenger compartment air temperature T_P and desired passenger compartment air temperature T_O using a predetermined equation;

(d) determining an air introduction condition selected by the passenger;

(e) calculating an air mix door opening percentage required to produce outlet duct air at temperature T_{AC} from one of a plurality of stored characteristic curves involving a predetermined relationship: of outlet duct air temperature T_{AC}, passenger compartment air temperature T_P and air introduction condition, to air mix door opening percentage X; said characteristic curves being stored as a pair of endpoint values T_L and T_H representing extreme values of outlet duct air temperature T_{AC} for the corresponding passenger compartment T_P and air introduction condition, the calculating step being performed by linearly interpolating the target outlet duct air temperature T_{AC} with respect to the endpoint values T_L and T_H; and

(f) positioning the air mix door in accordance with the calculated value of X.

4,450,898

AIR CONDITIONER FOR AUTOMOTIVE VEHICLE

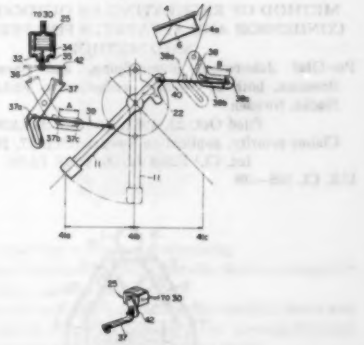
Mikio Tanino, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 28, 1981, Ser. No. 268,065

Claims priority, application Japan, Jun. 2, 1980, 55-72824

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—25 19 Claims



19. An air conditioner for an automotive vehicle's compartment which comprises: (a) an air conditioner compressor and an air conditioner compressor driving circuit for driving said compressor; (b) an evaporator operatively connected to said compressor for cooling an intake air inspired by an air blower; (c) a heater core arranged at a location downstream of said evaporator; (d) a passage bypassing said heater core; (e) a pivotable air-mixing door disposed to guide an air flow from said evaporator, respectively, through only said bypass passage at a first angular position, through only said heater core at a second angular position, and through said bypass passage and through the heater core between the first and second angular positions; (f) a lever which is pivoted between a first angular range and a second angular range with a fulcrum thereto as a center; (g) a first linkage member connected between said lever and air-mixing door which controls the angular position of said air-mixing door continuously between the first and second angular positions when said lever is angularly displaced within the first angular range and holds the angular position of said

air-mixing door at the first angular position when said lever is angularly displaced within the second angular range; (h) a temperature sensor located downstream of said evaporator for detecting the temperature of the intake air passed through said evaporator; (i) a first switch member included in said compressor driving circuit operable to close said compressor driving circuit so as to actuate said compressor when said lever is angularly displaced within the second angular range; (j) a second switch member, included in said compressor driving circuit in series with said first switch member and linked with said temperature sensor, which is operable to close said compressor driving circuit so as to actuate said compressor with said first switching member when said temperature sensor produces an output signal indicating that the temperature of intake air passed through said evaporator exceeds a predetermined temperature value and to open said compressor driving circuit to render said compressor inoperative when said temperature sensor produces no output signal to indicate that the temperature of the intake air passed through said evaporator is below the predetermined temperature value; (k) a second linkage member connected between said lever and second switch member which controls an interval of time between the closures of said second switch member so as to adjust the range of operation of said compressor continuously when said lever is angularly displaced within the second angular range and holds the interval of time at maximum when said lever is angularly displaced within the first angular range; and (l) a third switching member, included in said compressor driving circuit in parallel with said first switch member, operable to close said compressor driving circuit so as to actuate said compressor when said lever is angularly displaced within said first and second angular ranges regardless of the open and closure of said first switch member.

4,450,899

METHOD OF REGULATING AN OUTDOOR STEAM CONDENSOR AND APPARATUS FOR PERFORMING SAID METHOD

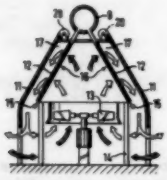
Per-Olof Jakobsson, Söderköping, and Sven Beverskog, Bromma, both of Sweden, assignors to Flakt Aktiebolag, Nacka, Sweden

Filed Oct. 23, 1981, Ser. No. 314,108

Claims priority, application Sweden, Oct. 27, 1980, 8007516

Int. Cl.³ F28B *11/00*; F28F *13/06*

U.S. Cl. 165—39 **11 Claims**



1. A method of regulating cooling of an outdoors-air-cooled steam condensor having heat exchangers with an air flow area and fan means to blow air outwardly through the entire air flow area of the heat exchangers, said condensor being fed by steam-line and being connected to discharge into condensate conduits, the improvement comprising the steps of providing screening and diversion shutter elements forming a curtain transverse to the direction of air flow through the air flow area of and spaced from the heat exchangers at a distance on the outside for diverting the outward flow and providing an air recirculation channel starting from the vicinity of said steam-line and extending along the outside of said heat exchangers towards said condensate conduits, and using said curtain to divert the outward flow to follow said channel and flow toward said conduits without substantially diminishing the flow through the heat exchanger, sensing the condensation pressure of the steam, the condensate temperature, and the outdoor air temperature, positioning the inlet of the fan means downstream of said conduits in the direction of the recirculation flow so that the flow from said channel passes said conduits and is recirculated into said fan, and regulating both the length of the curtain and the blowing of said fan means to keep the condensation pressure at a substantially constant value and the condensate temperature above freezing, the length of the curtain controlling the amount of the recirculated air, and the fan controlling the total quantity of air passing through the heat exchangers.

4,450,900

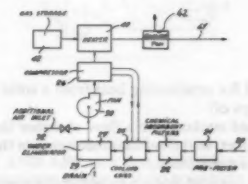
MOBILE AIR CONDITIONING UNIT

Norman Nathan, 3115 Montmorency, Longueuil, Quebec J4L 4C6, Canada

Filed Feb. 19, 1981, Ser. No. 235,975

Int. Cl.³ B60H *3/00*

U.S. Cl. 165—42 **8 Claims**



1. A mobile unit for use in conditioning air in a remote enclosed space having at least one opening therein, the unit being in the form of an open trailer comprising, an air entry having a purifying means to remove toxic gases, cooling means, dehumidifying means and heating means, ducting system from the air entry connecting in series the purifying means, cooling means, dehumidifying means, and heating means to an exit, fan means in the unit to circulate air in the ducting system from the air entry to the air outlet, a compressor in the ducting system connected with the cooling means and a duct from said dehumidifier through the hot section of said compressor and connected to said heater to provide a heat pump to preheat the air after cooling, an additional air inlet in the ducting system for selectively adding fresh makeup air, an exhaust fan located at the air entry, or the air exit, to remove excessive fumes from the enclosed space, and two removable flexible conduits for connecting the air entry and the air exit to the enclosed space.

4,450,901

HEAT RECOVERY ATTACHMENT FOR A HEATING APPARATUS

Norbert G. L. M. Janssen, Ulestraten, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 18, 1982, Ser. No. 340,048

Claims priority, application Netherlands, Jan. 16, 1981, 8100182

Int. Cl.³ F24H *3/00*

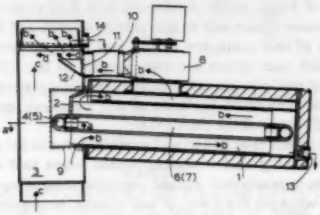
U.S. Cl. 165—47 **17 Claims**

1. A heat recovery attachment for a heating apparatus adapted to being operatively associated with a combustion gas discharge duct through which combustion gases flow in a predetermined direction, said device comprising in combination:

heat exchanger means for transferring a portion of the heat energy associated with said combustion gases to a working fluid including inlet means defining an inlet passageway for allowing at least a portion of said combustion gases to enter said heat exchanger means, outlet means defining an outlet passageway for allowing said combustion gases to exit said heat exchanger means, and fan means for encouraging said combustion gases to flow between said inlet and outlet means;

means for mounting said heat exchanger means to said discharge duct so that said inlet and outlet passageway means are in fluid communication with the interior of said discharge duct and so that a space is defined between said heat exchanger means and the opposite wall of said discharge duct thereby permitting a predetermined portion of said combustion gases to bypass said heat exchanger means; and

barrier means operatively associated with said outlet passageway means, said barrier means for establishing a barrier comprising flowing combustion gases which exit said heat exchanger means through said outlet passageway



means and for preventing loss of heat energy in that portion of said combustion gases which may initially bypass said heat exchanger means thereby causing substantially all of said bypass combustion gases to eventually flow through said heat exchanger means, said barrier means including baffle means having one end fixed near said outlet passageway means and another end inclined relative to said one end in the direction of said gas flow through said discharge duct for directing a predetermined portion of said combustion gases which exit through said outlet passageway means at an angle relative to the general direction of combustion gas flow in said discharge duct.

4,450,902

HEAT EXCHANGER IN PARTICULAR FOR AN ATMOSPHERIC COOLING TOWER

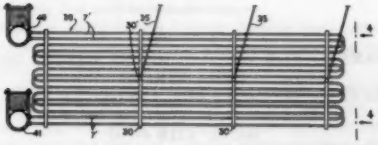
Jacques G. P. E. Bosne, Viroflay, France, assignor to Hamon-Sobelco, S.A., Brussels, Belgium

Continuation of Ser. No. 150,287, May 16, 1980, which is a division of Ser. No. 893,788, Apr. 5, 1978. This application Mar. 26, 1982, Ser. No. 362,058

Claims priority, application France, Oct. 7, 1977, 77 30221

Int. Cl.³ F28F 9/00

U.S. Cl. 165—82 **9 Claims**



1. A heat exchanger for exchanging heat between a first fluid and at least a second fluid, of the type comprising a horizontal battery of tubes of substantial length supported at intervals by spacer devices, said first fluid circulating through said tubes and said second fluid passing through said battery transversely with respect to the tubes, wherein said battery is suspended in at least a part of its length from suspension members to which said spacer devices are suspended and including inlet and outlet means for the first fluid comprising an inlet collector and an outlet collector to which the respective ends of each of said tubes are connected, said tubes being coiled to-and-fro in vertical planes extending in the longitudinal direction of the battery, a rigid support structure, means connecting the inlet collector and the outlet collector to the rigid support structure, said suspension members including first hooking points on each of said spacer devices, means connecting the lower ends of the suspension members to the first hooking points, second hooking points for each of the suspension members, said second hooking points positioned above the first hooking points of the spacer devices and horizontally offset in a direction to continuously urge its connected spacer device and the tubes supported therein away from the rigid support structure to thereby maintain the horizontal path of said battery of tubes during expansion and contraction of the tubes thereof, and wherein at least some of said spacer devices are intermediate the ends of said battery and urged away from said rigid support structure by said suspension members and wherein each of said spacer devices comprises a rigid frame having openings for support and passage of said tubes.

4,450,903

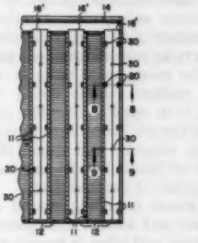
PLATE TYPE HEAT EXCHANGER WITH TRANSVERSE HOLLOW SLOTTED BAR

Alan G. Butt, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Sep. 20, 1982, Ser. No. 419,680

Int. Cl.³ F28F 3/00

U.S. Cl. 165—110 **16 Claims**



1. A plate type heat exchanger comprising

a. a plurality of generally planar metallic sheets arranged in spaced apart, parallel relationship;

b. bar means for sealingly connecting the metallic sheets and in conjunction therewith defining a first passage between adjacent facing surfaces of two of the sheets;

c. means for admitting and distributing a first fluid into the first passage;

d. a hollow metallic bar disposed within and across the first passage, downstream of the means for admitting and distributing the first fluid, said hollow bar being of a size to extend between the facing surfaces of the metallic sheets defining the second passage in support thereof, and including a plurality of channels formed in at least one of the surfaces of the hollow metallic bar abutting one of the metallic sheets; said hollow bar further including a plurality of orifices spaced apart along is length, for providing fluid communication between its hollow interior and the first passage;

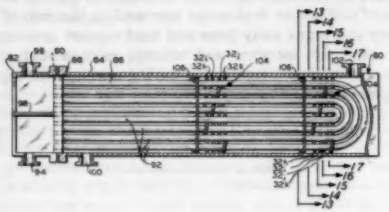
e. inlet means for admitting a second fluid into the interior of the hollow bar, said second fluid flowing through the orifices to mix with the first fluid within the first passage;

f. means for collecting and conveying the mixed first and second fluids out of the first passage after they have traversed at least a part of the heat exchanger.

4,450,904
HEAT EXCHANGER HAVING MEANS FOR SUPPORTING THE TUBES IN SPACED MUTUALLY PARALLEL RELATION AND SUPPRESSING VIBRATION

Herbert A. Volz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 31, 1978, Ser. No. 891,981
Int. Cl.[3] F28F 9/00
U.S. Cl. 165—162 18 Claims



1. An improved tube bundle assembly comprising:

a bundle of tubes having opposite ends, at least a portion of said tubes being longitudinally oriented and positioned in transversely spaced mutually parallel relation;

means for supporting the tubes in spaced mutually parallel relation and suppressing vibration of the tubes, said means characterized to include:

an annular enlargement disposed around and frictionally secured to the outer surface of at least one of the tubes intermediate the opposite end of the bundle of tubes, said annular enlargement peripherally contacting the outer surface of each of the tubes next adjacent to the tube carrying said annular enlargement;

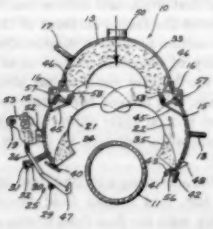
said annular enlargement being in the form of a spirally shaped resilient annular spring clip, said spring clip having, in its relaxed condition, an inside diameter less than the outside diameter of the tube about which it is disposed, whereby said spring clip is stressed and is thereby self-biased into frictional engagement with the outer surface of the tube; and

retaining means extending around said bundle of tubes proximate said annular enlargement for engaging and maintaining said tubes in spaced mutually parallel relation with said annular enlargement contacting the respective next adjacent tubes whereby relative tube position is maintained and tube vibration is suppressed.

4,450,905
MUD BUCKET

Scott L. Crain, R.R. 1, Morrowville, Kans. 66958

Filed Aug. 9, 1982, Ser. No. 406,165
Int. Cl.[3] E21B 19/00
U.S. Cl. 166—85 9 Claims



1. Apparatus for use in conjunction with a drilling rig for catching and saving mud or the like from inside of a drilling rig pipe of the type having a drill bit at the bottom thereof and a plurality of stands of pipe connected together by connection junctures, for use when the pipe is in the process of being pulled up out of a hole in the ground and when each topmost stand of pipe is disconnected from the adjacent lower stand of pipe at a connection juncture, one stand at a time during the pulling process, said apparatus comprising:

container means for forming a container around the topmost connection juncture for catching mud or the like when the topmost stand of pipe is disconnected from the adjacent lower stand of pipe at said topmost connection juncture;

a pair of hinge means connected to a first portion of said container means and to one side of second and third portions of said container means and being disposed along parallel axes which are also parallel to the longitudinal axis of said pipe for selectively permitting pivoting of said second and third portions of the container means outwardly away from each other;

closing means attached to said container means for automatically closing said container means when said container means is positioned at said one side thereof against said pipe whereby the force of said closing means against said pipe will cause said container means to close, said closing means including a first arm means attached to said second portion of said container means and extending inwardly of said container for contact with said pipe, and whereby movement of said first arm means against said pipe when said second portion of said container means is in the open position thereof causes said second portion of said container means to move toward the closed position thereof and a second arm means attached to said third portion of said container means for contact with said pipe and whereby movement of said second arm means against said pipe when said third portion of said container means is in the open position thereof causes said third portion of said container means to move toward said closed position thereof;

latch means attached to the other side of said second and third portions of said container means for locking said container means in a closed position in sealing engagement with said pipe around said topmost connection juncture, said latch means including means for automatically latching said container means in a closed position when said container means moves to said closed position, and including means for selectively unlocking said latch means, whereby said container means can be opened after it has been drained for use on the next connection juncture to be disconnected; and

drain means for emptying mud from said container means after said topmost pipe has been disconnected.

4,450,906
APPARATUS FOR MEASURING THE WEIGHT OF THE DRILL STRING

Daniel Firmin, 215 Camelia Blvd., Lafayette, La. 70503

Filed Jan. 20, 1982, Ser. No. 340,987
Int. Cl.[3] E21B 49/00
U.S. Cl. 166—113 6 Claims

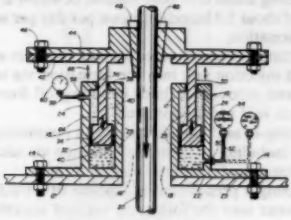
1. An apparatus for measuring the weight of tubular string lowered into a well, comprising:

a. annular expandable hydraulic cylinder means having a central bore through which the tubular string can freely pass for temporarily supporting the tubular string at least when its weight is to be determined;

b. removable slip means placeable between the tubular string and the annular expandable hydraulic cylinder means for forming a load transfer interface between the tubular string and the expandable hydraulic cylinder means when the tubular string weight is to be measured; and

c. guage means hydraulically connected to the annular expandable hydraulic cylinder means for indicating weight

of the tubular string response to a transfer of the tubular string weight to the annular expandable hydraulic cylinder means by insertion of the removable slips between the tubular string and cylinder means.

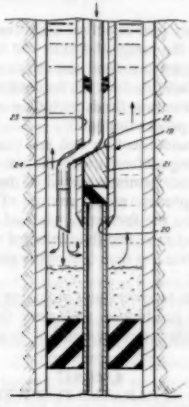


4,450,907

CLEANING SYSTEM FOR PACKER REMOVAL

James M. Clark, Lafayette, La., and Tony M. Small, Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1982, Ser. No. 399,544
Int. Cl.³ E21B *21/00*
U.S. Cl. 166—223 **3 Claims**



1. Apparatus for cleaning material from a location above a packer means in a well bore including:

an overshot means having a lower opening sized and constructed to be received over a cut end of a tubing string attached to a packer means;

said overshot means being adapted for coupling to a string of tubing and having a closed off bore portion above said lower open end, said overshot means having a bore above said closed end and said overshot means having an opening through its side in communication with said bore above said closed end;

a well cleaning tool adapted to be passed through a string of tubing attached to said overshot, said well cleaning tool having a depending flexible hose member below said packing means, said hose member being sized and constructed to pass through said opening in said overshot means;

means placing said hose member in fluid communication with the tubing above said packing means whereby fluid may be discharged through said hose to agitate materials into the fluid in the well bore annulus between the tubing string and well casing.

4,450,908

ENHANCED OIL RECOVERY PROCESS USING MICROORGANISMS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1982, Ser. No. 374,540
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—246 **7 Claims**

1. A process for the recovery of oil from an underground oil-bearing reservoir containing polymer-adsorbing rock comprising the steps of:

(a) injecting a polymeric viscosifier-thickened aqueous slug into the reservoir via an injection well;

(b) subsequently injecting an aqueous slug into the reservoir via the injection well and forcing the aqueous slug through the reservoir so as to push the polymeric viscosifier toward the production well;

(c) subsequently injecting an aqueous solution of a microorganism capable of metabolizing the polymeric viscosifier into the reservoir via the injection well and forcing the microorganism through the reservoir toward the production well;

(d) subsequently injecting a drive fluid into the reservoir via the injection well and driving oil toward the production well; and

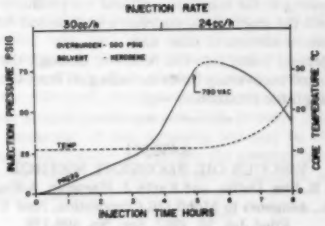
(e) producing oil via the production well.

4,450,909

COMBINATION SOLVENT INJECTION ELECTRIC CURRENT APPLICATION METHOD FOR ESTABLISHING FLUID COMMUNICATION THROUGH HEAVY OIL FORMATION

Aleksy Sacuta, Edmonton, Canada, assignor to Alberta Research Council, Edmonton, Canada

Filed Oct. 22, 1981, Ser. No. 313,748
Int. Cl.³ E21B *43/24, 43/25*
U.S. Cl. 166—248 **1 Claim**



1. A method for opening a fluid communication channel between injection and production wells in a previously unheated heavy oil reservoir wherein the oil is not amenable to being produced by a drive fluid, which consists essentially of:

injecting a cold solvent for the heavy oil into the unheated reservoir; and

while such solvent is moving through the unheated reservoir, simultaneously passing electric current between a positive electrode positioned in the injection well and a negative electrode positioned in the production well to reduce the injection pressure required.

4,450,910

THERMAL RECOVERY OF VISCOUS OIL FROM A DIPPING RESERVOIR

William C. Hunt, III, Farmers Branch, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,825
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—261 **10 Claims**

1. A method for recovering oil from a subterranean, viscous

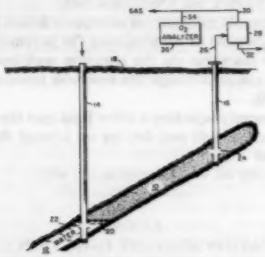
oil-containing reservoir having a dip and having a water zone in fluid communication with and directly below the oil-containing reservoir to form an oil/water interface, said method comprising the steps of:

(a) providing an injection well from the earth's surface in fluid communication with the oil-containing reservoir near the oil/water interface;

(b) providing a production well from the surface in fluid communication with the oil-containing reservoir at a shallower depth;

(c) initiating an in situ combustion operation in the oil-containing reservoir near the oil/water interface by injecting an oxidizing gas into the injection well;

(d) recovering fluids including oil and an effluent gas from the reservoir through the production well;



(e) continuing injection of the oxidizing gas into the reservoir through the injection well for a predetermined amount of time;

(f) terminating injection of the oxidizing gas and continuing to recover fluids including oil and effluent gas from the reservoir through the production well until the fluids recovered contain essentially no effluent gas;

(g) shutting-in the injection well and the production well to permit the reservoir to undergo a soak period for a predetermined amount of time; and

(h) injecting water into the reservoir through the injection well and recovering fluids including oil from the reservoir through the production well.

4,450,911

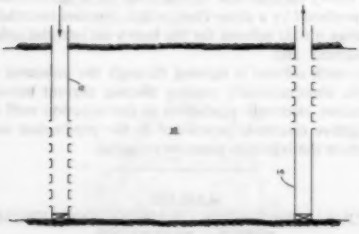
VISCOUS OIL RECOVERY METHOD

Winston R. Shu, Dallas, and Kathy J. Hartman, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 20, 1982, Ser. No. 400,178

Int. Cl.[3] E21B *43/24*

U.S. Cl. 166—263 **10 Claims**



1. A method for the recovery of oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well in fluid communication with the lower 50% or less of the formation, at least one spaced-apart production well in fluid communication with the upper 50% or less of the formation, said injection well and said production well having a communication relationship in the bottom zone of the formation and the wells spaced-apart a predetermined distance, comprising:

(a) injecting about 0.37 pore volume of steam at an injection rate of about 5.0 barrels of steam per day per acre-foot into the formation;

(b) injecting a predetermined amount of steam at a predetermined injection rate into the formation via said injection well and recovering fluids including oil from the formation via said production well;

(c) shutting-in said injection well and continuing to recover fluids including oil from the formation via said production well for a predetermined period of time;

(d) injecting a predetermined amount of a fluid comprising hot water into the formation via said injection well at a predetermined rate, said fluid injected in an amount and at an injection rate less than that of the steam injected during step (b); and

(e) continuing to recover fluids including oil from the formation via said production well until the recovered fluids contain an unfavorable amount of steam or water.

5. A method for the recovery of oil from a subterranean, viscous oil-containing formation penetrated by at least one injection well in fluid communication with the lower 50% or less of the formation, and at least one spaced-apart production well in fluid communication with the upper 50% or less of the formation, said injection well and said production well having a communication relationship in the bottom zone of the formation, comprising:

(a) spacing apart said injection and production well a distance within the range of 400 to 750 feet;

(b) injecting a predetermined amount of steam at a predetermined injection rate into the formation via said injection well and recovering fluids including oil from the formation via said production well;

(c) shutting-in said injection well and continuing to recover fluids including oil from the formation via said production well for a predetermined period of time;

(d) injecting a predetermined amount of a fluid comprising hot water into the formation via said injection well at a predetermined rate, said fluid injected in an amount and at an injection rate less than that of the steam injected during step (b); and

(e) continuing to recover fluids including oil from the formation via said production well until the recovered fluids contain an unfavorable amount of steam or water.

4,450,912

METHOD AND APPARATUS FOR WELL CEMENTING THROUGH A TUBULAR MEMBER

Rudy B. Callihan, and Lyndon R. Stone, both of San Antonio, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 7, 1982, Ser. No. 385,616

Int. Cl.[3] E21B *33/14*

U.S. Cl. 166—289 **11 Claims**

9. The method of cementing a well conduit by cement applied from the surface through a second conduit and a tubular member disposed within the well conduit, comprising the steps of:

(1) providing an axial passage for cement flow through the bottom end of the well conduit;

(2) providing ports for cement flow through the wall of the well conduit at a location spaced above the axial flow passage and a sleeve valve normally closing the ports;

(3) sealingly securing the bottom end of the tubular member with the well conduit;

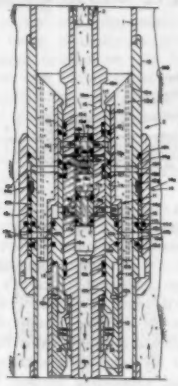
(4) completing a first stage of cementing by applying cement from the surface through the second conduit, axially through the tubular member and through the axial passage in the bottom of the conduit to fill cement around the well conduit to a level below the cement passage;

(5) sealing the flow path to the axial cement passage;

(6) moving a sleeve valve to open the radial cementing ports;

(7) completing a second stage of cementing by supplying

cement from the surface through the second conduit, radially through the tubular member and outwardly through the cementing ports; and



(8) sealing the cementing ports by moving a second sleeve valve on the exterior of the conduit into sealing relationship with the cementing ports.

4,450,913

SUPERHEATED SOLVENT METHOD FOR RECOVERING VISCOUS PETROLEUM

Joseph C. Allen; Robert E. Gillespie, both of Bellaire, and David B. Burnett, Carrollton, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,389
Int. Cl.³ E21B *43/24, 43/40*
U.S. Cl. 166—303 **4 Claims**

1. A method for recovering hydrocarbons from a subterranean hydrocarbon formation penetrated by at least one well, consisting essentially of:

(a) injecting into the hydrocarbon formation through a well a fluid consisting essentially of superheated solvent selected from the group consisting of butane, pentane, hexane, heptane, and octane, while simultaneously restricting production to increase formation pressure,

(b) said solvent being injected at an elevated pressure sufficient to dissolve the solvent into the subterranean hydrocarbons, rendering the hydrocarbons mobile;

(c) ceasing the injection of the solvent;

(d) depleting formation pressure to substantially below the pressure which existed prior to injection by producing hydrocarbons without restriction until hydrocarbon production becomes relatively insignificant;

(e) recovering the injected solvent along with the produced hydrocarbons; and

(f) repeating the above injection and pressure depletion sequence.

4,450,914

WELL TREATMENT VALVE

James Elphick, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 25, 1982, Ser. No. 342,550
Int. Cl.³ E21B *34/00*
U.S. Cl. 166—325 **10 Claims**

1. A well treatment valve for use in acidizing a well including:

a valve housing with inlet and outlet chambers,

a valve seat disposed within said housing between said inlet and outlet chambers,

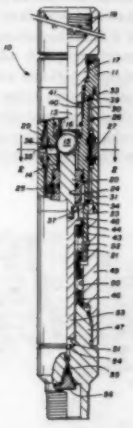
a valve body within said housing and movable relative to said seat between open and closed positions,

a spring chamber associated with said housing but sealed against fluid communication with said outlet chamber,

a pressure passage communicating between said inlet chamber and said spring chamber,

a bore extending between said outlet chamber and said spring chamber,

an actuating rod with a lower end portion disposed within said spring chamber and an upper end portion extending through and pressure sealed within said bore for engagement with said valve body,



a high pressure chamber sealed within said spring chamber and charged to a preselected high pressure,

said lower end portion of said actuating rod effectively extending into said high pressure chamber and being urged by the pressure therein toward said engagement with said valve body to close said valve, and

means for effectively sealing between said lower end portion of said actuating rod and said high pressure chamber so that movement of said actuating rod may be controlled virtually exclusively by varying the pressure in said inlet chamber relative to the charged pressure in said high pressure chamber.

4,450,915

SELF-PROPELLED DISK HARROW

Kermit M. DeHaai, R.R. 1, Monroe, Iowa 50170

Continuation of Ser. No. 189,341, Sep. 22, 1980, abandoned. This application Aug. 15, 1982, Ser. No. 405,393
Int. Cl.³ A01B *33/02*
U.S. Cl. 172—55 **10 Claims**

3. In a self-propelled disk harrow apparatus having:

a frame with a longitudinal axis defined thereby;

a plurality of wheels rotatably attached to said frame, the forwardmost of said wheels being spaced longitudinally from the rearwardmost of said wheels by at least one-half the operable length of the frame;

means rotatably mounting a plurality of ground engaging disc members to said frame for causing said disc members to carry substantially all of the weight of said disk harrow during normal tilling operations, said disc members extending a substantial distance below said wheels when said disk harrow is in a ground tilling position, said disc members being disposed on first, second, third and fourth axles, said axles being disposed on different axes with respect to each other, said second axle being disposed behind said first axle, said third axle being disposed behind said second

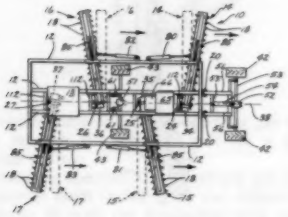
axle, and said fourth axle being disposed behind said third axle;

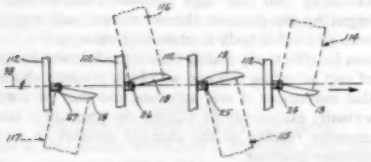
said first and third axles being disposed on one side of said longitudinal axis, said second and fourth axles being disposed on the other side of said longitudinal axis;

means operatively attached to said frame for rotating said disc members to thereby propel said disk harrow and till the ground;

means operatively attached to said frame for rotating at least some of said wheels at substantially the same speed as to rotational speed of said disc members whereby if said disc members extend into the ground more than said substantial distance, a substantial amount of the weight of the disk harrow will transfer to said wheels to help propel the disk harrow and prevent it from becoming stuck;

the improvement comprising pitch adjustment means for varying the angle of the rotational axis of the axles of the first, second, third and fourth axles with respect to the longitudinal axis of the frame, said pitch adjustment means including a first overlap preventing means for preventing the disc members on the second axle from overlapping the





ground covered by the disc members on the first axle in any angle of pitch of said first and second axles, said first overlap preventing means comprising first means for pivotally connecting one end of said first axle to said frame along a first vertical axis and second means for pivotally connecting one end of said second axle to the frame along a second vertical axis, said first and second vertical axes being substantially offset with respect to, and thereby not intersecting with, the respective rotational axis of said first and second axles; said pitch adjustment means further including a second overlap preventing means for preventing the disc members on the fourth axle from overlapping the ground covered by the disc members on the third axle in any angle of pitch of said third and fourth axles, said second overlap preventing means comprising third means for pivotally connecting one end of said third axle to said frame along a first vertical axis and fourth means for pivotally connecting one end of said fourth axle to the frame along a fourth vertical axis, said third and fourth vertical axes being substantially offset with respect to, and thereby not intersecting with, the respective rotational axis of said third and fourth axles.

4,450,916

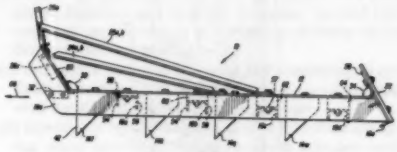
EARTH CLOD PULVERIZER

Thomas E. Francis, 1814 Lakeside Dr., Quinton, Va. 23141

Filed Jul. 19, 1982, Ser. No. 399,939

Int. Cl.³ A01B *27/00, 35/08*

U.S. Cl. 172—147 **12 Claims**



1. An earth clod pulverizing and earth smoothing implement of a type to be moved across the surface of the earth in a forwardly direction of travel while engaging the earth to break apart relatively large clods near the earth's surface and otherwise prepare the earth's surface for further use, said implement comprising a frame for defining a supporting surface to be approximately parallel to the earth's surface while said implement is in use and for supporting earth-engaging members extending from said supporting surface downwardly, said earth-engaging members including teeth;

the improvement wherein said teeth are wedge-shaped in cross section taken on a plane parallel to the earth's surface, with the cutting edge of each wedge defining a substantially vertical line facing the forwardly direction with relatively flat sides of the wedge flaring rearwardly and laterally of the forwardly direction, and said teeth having pointed tips directed downwardly into the earth's surface with trailing sides of said teeth sloping upwardly from said pointed tips a vertical distance of substantially greater than half the lengths of the teeth, said teeth being constructed of a cast metal and each tooth weighing at least 25 pounds.

4,450,917

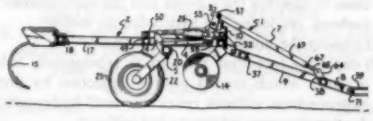
SELF-LEVELING ARRANGEMENT FOR AGRICULTURAL IMPLEMENT FRAME

Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Company, Inc., Tipton, Kans.

Filed Aug. 13, 1982, Ser. No. 408,014

Int. Cl.³ A01B *59/00*

U.S. Cl. 172—328 **3 Claims**



1. A self-leveling arrangement for use on an agricultural implement supporting frame including ground engaging means, frame lift means operatively connected between said frame and said ground engaging means and operable to raise said frame to a transport position and to lower said frame to a soil working position, and a draft tongue pivotally connected to a frame front end of said frame and having a hitch member on a tongue front end of said tongue for connecting said frame to a draft vehicle, said self-leveling arrangement comprising:

(a) a rocker arm pivotally mounted on said frame and having a first end and an opposite second end;

(b) a transfer link pivotally connected between said first end of said rocker arm and said frame lift means;

(c) a leveling link pivotally connected between said second end of said rocker arm and said tongue front end whereby upon raising said frame toward said transport position said frame front end is raised and upon lowering said frame

toward said soil working position said frame front end is lowered to thereby maintain a substantially constant pitch of said frame;

(d) said rocker arm, said transfer link, and said leveling link respectively being a first rocker arm, a first transfer link, and a first leveling link;

(e) a second rocker arm substantially similar to said first rocker arm being pivotally mounted on said frame in laterally spaced relation to said first rocker arm, said second rocker arm having a first end and a second end;

(f) a second transfer link being pivotally connected between said first end of said second rocker arm and said frame lift means;

(g) a second leveling link being pivotally connected between said second end of said second rocker arm and said tongue front end; and

(h) said first and second leveling links extending toward said tongue front end in forwardly converging relation.

4,450,918

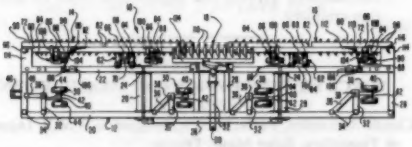
DISCING TOOL POSITIONABLE TO BE TRANSPORTED

Jack D. Danford, Box 98, Watkins, Colo. 80137

Filed May 4, 1982, Ser. No. 374,765

Int. Cl.³ A01B *21/08, 73/00*

U.S. Cl. 172—583 **7 Claims**



1. A discing tool for working wide portions of soil and also positionable to be transported on a highway, comprising:

an elongated frame having a longitudinal axis for attachment to a towing vehicle, said frame including an elongated hitch bar, an elongated chassis member parallel to said hitch bar but spaced therefrom, a draft bar joining said hitch bar and said chassis member together, and at least one vertical brace connected to said draft bar and extending upwardly therefrom;

a first outer disc gang having a length corresponding to substantially one-half the length of said frame and including a plurality of discs, said first outer disc gang having a first end pivotally connected to said frame adjacent the mid portion thereof and a second end extending in a first direction away from the mid portion of said frame;

a second outer disc gang having a length corresponding to substantially one-half the length of said frame and including a plurality of discs, said second outer disc gang having a first end pivotally connected to said frame adjacent the mid portion thereof and a second end extending in a second direction, substantially opposite the first direction of said first outer disc gang, away from the mid portion of said frame, the lengths of said first and second outer disc gangs together substantially corresponding to the length of said frame;

pivoting means connecting each of said first and second outer disc gangs to said frame adjacent said second ends of each of said first and second outer disc gangs to said frame adjacent said second ends of each of said first and second outer disc gangs so that said second ends are pivotal about each of said first ends so that when said discs are working the soil said outer disc gangs are positioned at an angle relative to said frame and when said discs are transported said outer disc gangs are generally parallel to said frame;

means for supporting said frame and said first and second outer disc gangs; and

center disc gang means having a plurality of center discs, said center disc gang means being connected to said frame adjacent the mid portion thereof, said center discs being used to work the soil between the first ends of said first and second outer disc gangs, said center disc gang means further including a center disc rod on which said center discs are mounted, the length of said center disc rod being substantially less than the length of said first outer disc gang, a trunnion fastened to said frame to permit the rotating of said center disc gang means above said frame, a center plate interconnecting said center disc rod and said trunnion, and means interconnecting said vertical brace and said center plate for rotating said center plate along a vertical arcuate path.

4,450,919

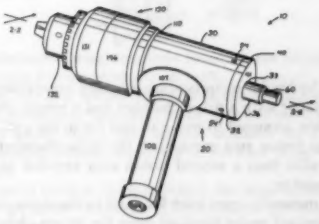
DRILL ATTACHMENT

Bernard L. Cousineau, 345 N. Schiller, Palatine, Ill. 60067

Filed Jan. 3, 1983, Ser. No. 455,226

Int. Cl.³ B21J *00/00*; E02D *7/02*

U.S. Cl. 173—29 **17 Claims**



1. A hammer assembly for a drill including a case, a hammer mechanism operatively mounted within said case and a handle secured to the exterior of said case, wherein:

a. said case is an elongated member having a closeable end at one end thereof and a bit end oppositely disposed from said closeable end;

b. said hammer mechanism includes a rotating member adjacent said closeable end partially within said case and partially outside of said case; wherein

(1) said rotating member is a rotating spindle;

(2) said rotating spindle has a drill end through said drive aperture on an exterior of said case, and a receiving end oppositely disposed from said drill end in an interior of said case;

(3) said receiving end includes a hollow cylindrical portion open at a first end and closed at a second end, said second end being adjacent said drill end; and

(4) a key slot in a side of said hollow cylindrical portion;

c. said hammer mechanism further includes a reciprocating member within said case having a connecting means at one end thereof for connecting said reciprocating member to said rotating member and a chuck securing means oppositely disposed from said connecting means, said chuck securing means serving to operatively connect a chuck assembly for holding a drill bit to said hammer assembly; wherein

(1) said reciprocating member is a reciprocating spindle,

(2) said reciprocating spindle has a slotted end and a threaded end oppositely disposed from said slotted end, and

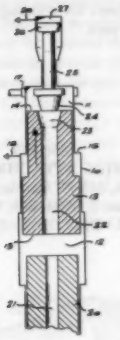
(3) said slotted end fits into said hollow cylindrical portion; and

d. a handle securing means for securing a handle to said case.

4,450,920
HYDRAULIC RECIPROCATING MACHINES

Eugene L. Krasnoff, Princeton, and Herman Lindeboom, Ringoes, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 3, 1981, Ser. No. 327,246
Claims priority, application South Africa, Jul. 13, 1981, 81/4749
Int. Cl.³ E21C *7/08*; B25D *17/16*
U.S. Cl. 173—80 **6 Claims**

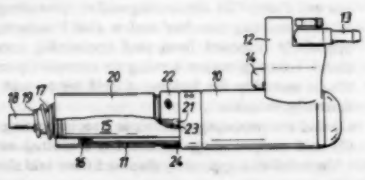


1. A hydraulic reciprocating machine comprising:
a cylinder with a drive chamber and a return chamber;
a piston arranged to move to and fro in the cylinder with a first piston area exposed to the drive chamber and being smaller than a second piston area exposed to the return chamber;
a permanently open inlet for fluid to the drive chamber;
a restricted outlet for fluid from the return chamber;
a bore extending through the piston from a port in its first area to its second area;
a first valve with a head adapted to seat on the port and a stem guided in the end wall of the drive chamber;
means for limiting the extent of travel of the first valve with the piston so that the first valve travels with the piston a determined portion of the way from the drive chamber towards the return chamber; and
a shoulder between the drive and return chambers and a vent in the return chamber adjacent the shoulder.

4,450,921
POWER OPERATED PERCUSSION TOOL HAVING GRIPPING MEANS

Ulf K. Arvidsson, Stockholm, and Per A. L. Gidlund, Täby, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 11, 1981, Ser. No. 330,086
Claims priority, application Sweden, Dec. 18, 1980, 8008915
Int. Cl.³ B25D *9/00*
U.S. Cl. 173—162 H **9 Claims**

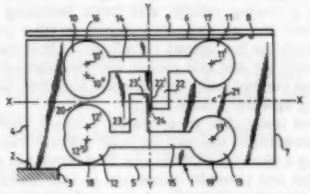


1. A vibration damped power operated percussion tool, comprising in combination:
an impact mechanism;
means on said impact mechanism for operative connection of a working implement thereto;
a housing supporting said impact mechanism and being vibration insulated relative to said impact mechanism, said vibration insulated housing having a portion extending in given axial direction, and a forward end beyond which said working implement extends;
a handle at the rear end of said housing for manual support of the tool by an operator;
a sleeve element extending in said axial direction and being adjustably mounted around at least a portion of said axially extending portion of said vibration insulated housing so as to be adjustable in position relative to said housing in said axial direction;
said sleeve element, in use of said tool, extending beyond the forward end of said housing, thereby forming an advanced vibration insulated grip means which is grippable by the tool operator during use of the tool; and
arresting means coupled to said sleeve element for arresting movement of said sleeve element relative to said housing for preventing unintentional axial displacement of said sleeve element relative to said housing, said arresting means comprising a friction coupling for frictionally engaging said sleeve element to said housing, and a clamping device operatively coupled to said sleeve element for continuously varying the engagement force of said friction coupling.

4,450,922
FORCE SENSING DEVICE FOR MEASUREMENT APPARATUS

Claude Alexandre, Paris, France, assignor to R.M.S. Ingenierie et Financiere, Saint Maur, France

Filed Mar. 9, 1982, Ser. No. 356,535
Claims priority, application France, Mar. 17, 1981, 81 05281
Int. Cl.³ G01G *3/14, 3/08*; G01L *1/22*
U.S. Cl. 177—211 **6 Claims**



1. In a force sensing device for measuring a vertical force comprising a homogeneous parallelepipedic block of constant thickness having front and back faces, lower and upper sides and first and second vertical sides, said block being provided with:
first upper and lower transverse openings near said first vertical side determining first upper, middle and lower thinner zones of lesser dimension as measured along a vertical axis,
second upper and lower transverse openings near said second vertical side determining second upper, middle and lower thinner zones of lesser dimension as measured along a vertical axis, said first and second middle thinner zones being symmetrical in relation to a plane parallel with said upper and lower sides,
upper and lower horizontal slots connecting said first and second upper transverse openings and said first and second lower transverse openings, respectively,
a first vertical slot near said first lower transverse opening connected with said lower horizontal slot,
a second vertical slot near said second upper opening connected with said upper horizontal slot, and
a central portion determined by said vertical slots,

said force sensing device further comprising first means for securing thereof to a support near said first vertical and lower sides, second means for securing of said device to a reception plate on which forces to be measured are to be exerted, and stress gauges located on said first middle thinner zone, the improvement being

said central portion determined by said horizontally offset vertical slots comprises a single vertical thinner zone of lesser dimension as measured along an axis at right angles with said vertical sides, said vertical thinner zone having a minimum thickness in said plane of symmetry of said first and second middle thinner zones.

4,450,923

ELECTRONIC WEIGHING SCALE

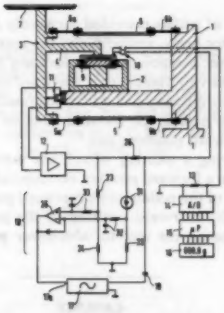
Lothar Behrend, Diemarden; Erich Knothe, Bovenden; Franz-Josef Melcher, and Jürgen Ober, both of Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,676

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149990

Int. Cl.³ G01G *1/38, 3/14;* G01R *17/06*

U.S. Cl. 177—212 **4 Claims**



1. In an electronic weighing scale based on the principle of electromagnetic force compensation having

(a) at least one coil which is located in an air gap of a stationary permanent magnet system and is loaded over a position sensor (11) and a gain control amplifier (12) by a direct compensating current dependent on the load on the scale,

(b) a precision resistor (13) through which the same direct compensating current flows and at both ends of which a signal dependent on the load of the scale can be tapped off and fed to an analog to digital converter,

(c) and an alternating voltage generator (17) which is regulated in its amplitude by a control circuit and which allows an alternating current to flow at least through the coil in addition to the direct compensating current, wherein the improvement comprises including a voltage divider circuit (21, 22) in parallel with the coil (9) and the precision resistor (13) is provided which has at least one highly temperature-dependent resistor (21), whereby the direct and alternating current through this highly temperature-dependent resistor (21) is proportional to the direct and alternating current through the coil (9); a control circuit (18) regulates the amplitude of the alternating voltage generator (17) in such a manner that the resistance value of the highly temperature-dependent resistor (21) remains as constant as possible.

4,450,924

ELECTRONIC WEIGHING SCALE

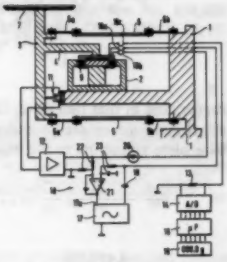
Lothar Behrend, Gleichen/Diemarden; Eric Knothe, Bovenden; Franz-Josef Melcher, and Jürgen Ober, both of Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,784

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149989

Int. Cl.³ G01G *1/38, 3/14;* G01R *17/06*

U.S. Cl. 177—212 **6 Claims**



1. In an electronic weighing scale based on the principle of electromagnetic force compensation with:

(a) at least one coil which is located in the air gap of a stationary permanent magnet system and is loaded over a position sensor and a gain control amplifier by a direct compensating current dependent on the load of the weighing scale,

(b) a precision resistor through which the same direct compensating current flows and at both ends of which a signal dependent on the load of the weighing scale can be tapped off and fed to an analog to digital converter,

(c) a heating resistor connected in series to the coil and the precision resistor,

(d) and an alternating voltage generator which is regulated in its amplitude by a control circuit and which allows an alternating current to flow through the coil, the precision resistor and the heating resistor in addition to the direct compensating current, the improvement comprising:

the heating resistor having a highly temperature-dependent resistance value, and

a control circuit (18) regulates the amplitude of the additional alternating current in such a manner that the resistance value of the heating resistor (20) retains a value which is relatively constant.

4,450,925

WHEELED INDUSTRIAL/AGRICULTURAL TRACTORS

Peter C. Gardner, Stroud, England, assignor to H. Cameron Gardner Ltd. and Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

PCT No. PCT/GB81/00081, 371 Date Dec. 21, 1981, 102(e) Date Dec. 21, 1981, PCT Pub. No. WO81/03154, PCT Pub. Date Nov. 12, 1981

PCT Filed May 1, 1981, Ser. No. 444,395

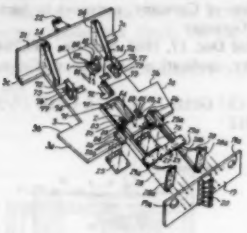
Claims priority, application United Kingdom, May 1, 1980, 8014471

Int. Cl.³ B62D *21/18;* B64F *1/22*

U.S. Cl. 180—89.1 **16 Claims**

1. A wheeled industrial/agricultural tractor having a chassis provided by a series arrangement of front axle support, engine block, transmission housing, and back axle unit, the tractor being characterised by the provision of an equipment support frame (3, 28) in the form of a base plate (3) carried beneath an operator's station portion of the chassis (50, 10, 51, 52, 53), and a pair of transversely spaced struts (28) secured (25) to the front portion of the base plate (3) and arranged to extend

forwardly thereof, the front ends of the struts having attachment means (19, 28a) for the support of equipment (20) at the



front of the tractor, and in that first (1, 2, 70) and second (27, 29:28c, 28d) attachment means are provided for respectively securing the base plate and struts to the chassis.

4,450,926

VEHICLE BODY

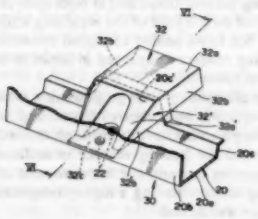
Isao Suzuki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1982, Ser. No. 361,753

Claims priority, application Japan, Mar. 26, 1981, 56-42583[U]

Int. Cl.³ B62D *25/20*

U.S. Cl. 180—312 **8 Claims**



1. A vehicle body comprising a dash lower panel; a dash lower cross member attached to said dash lower panel and extending transversely of the vehicle body, said dash lower cross member having a channel-like section and cooperating with said dash lower panel to form a closed-section structure; a front floor panel secured to a rear margin of said dash lower panel, said dash lower panel and said front floor panel being formed with a common floor tunnel which extends longitudinally of the vehicle body and is located substantially at a middle portion of the dash lower panel and the front floor panel; a stiffener made of sheet material and shaped to conform to the cross section of said floor tunnel, said stiffener being arranged in said floor tunnel and secured to tunnel-defining walls of said dash lower panel and said front floor panel, said stiffener having a front end portion received in said closed section structure, said front end portion having a bottom wall secured to a bottom wall of the dash lower cross member, said stiffener also including a portion extending rearwardly from the front end portion and having side wall means connected to tunnel defining side walls of the dash lower panel; and a rear mounting bracket secured to said dash lower cross member together with the front end portion of said stiffener, said rear mounting bracket extending forwardly from said dash lower cross member to engage an engine to limit the extent of engine roll.

4,450,927

APPARATUS FOR CONTROLLING AGRICULTURAL TRACTOR

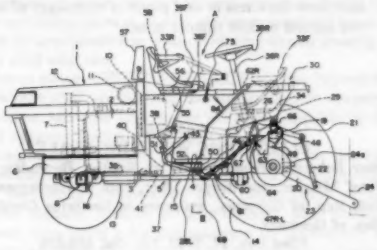
Kazuo Hirata, Sakai, and Masao Takagi, Hashimoto, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 10, 1982, Ser. No. 376,500

Claims priority, application Japan, Jun. 9, 1981, 56-85290[U]

Int. Cl.³ B62D *1/18*

U.S. Cl. 180—330 **5 Claims**



1. An agricultural tractor comprising:

a tractor body;

a plurality of speed change levers mounted on the tractor body;

a plurality of pedals provided forwardly and rearwardly on the tractor body, respectively, the rearward pedals being at a higher position than the forward pedals;

a seat selectively fixable to a rearward position opposed to the forward pedals and a forward position opposed to the rearward pedals, the forward position being higher than the rearward position; and

a post having a steering wheel, the post being selectively fixable to a forward position corresponding to the forward position of the pedals and a rearward position corresponding to the rearward position of the pedals, the steering wheel facing the seat to whichever position the post is fixed.

4,450,928

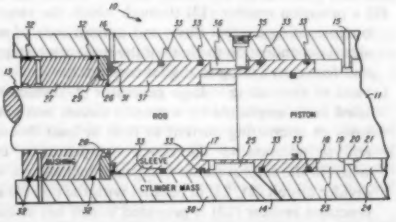
DUAL MODE SEISMIC SOURCE VIBRATOR

Richard M. Weber, Prosper, and John W. Bedenbender, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 3, 1981, Ser. No. 289,444

Int. Cl.³ G01V *1/133*

U.S. Cl. 181—121 **10 Claims**



1. A dual mode seismic source vibrator actuated by a hydraulic supply source providing working and high pressures, operated at varying frequencies supplied by a variable frequency generator and having a piston and piston rods attached to and extending therefrom within a reciprocally disposed reaction mass forming an hydraulic drive cylinder, comprising:

(a) working pressure port means, for introducing hydraulic

fluid from the working pressure source at a frequency determined by the variable frequency generator, alternately against each face of the piston to cause the piston to reciprocate;

(b) stroke adjusting means, positioned within the cylinder, surrounding the piston and piston rods, adapted to slideably engage the piston rods within the outer portions of its length and to slideably engage the piston within the central portion of its length, the stroke adjusting means being adapted to slide within the cylinder to effectively shorten or lengthen the central portion thereby shortening or lengthening the piston stroke;

(c) low frequency port means, positioned to move the stroke adjusting means to lengthen the stroke when the high pressure is present;

(d) high frequency port means positioned to move the stroke adjusting means to shorten the stroke when the high pressure is present; and

(e) valve control means electrically connected to the variable frequency generator and hydraulically selectively connected to the low or high frequency port means, and to the hydraulic supply source of high pressure, reactive to the variable frequency generator to apply the high pressure through the low frequency port means when the variable frequency generator frequency is below a predetermined frequency, and vice versa when the variable frequency generator frequency is above the predetermined frequency, thereby moving the stroke adjusting means to lengthen and to shorten the piston stroke, respectively.

4,450,929

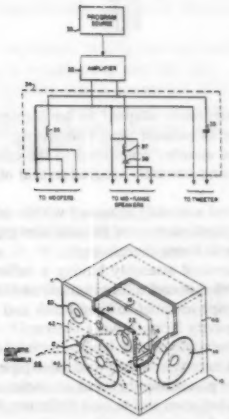
ACOUSTIC ENERGY SYSTEMS

Ralph E. Marrs, 6809 Chateau Ct., San Jose, Calif. 95120

Division of Ser. No. 148,482, May 9, 1980, which is a continuation-in-part of Ser. No. 903,489, May 8, 1978, abandoned. This application Sep. 7, 1982, Ser. No. 415,190

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—146 **45 Claims**



1. A system for exhibiting enhanced volumetric compliance in response to acoustic waves within an enclosure, comprising:

at least two spaced apart volumetric containers within the enclosure each being substantially transparent to force, pressure or volumetric displacements acting on the container and each containing a matrix of thin spaced apart layers of microfibers spatially distributed within the container;

each of the containers further including a two phase fluid system comprising a liquid and a gas, the liquid of which were the microfibers throughout the matrix and the liquid and gas being in thermodynamic equilibrium, such that vapor molecules exist in the spaces between the fibers and the fibers and liquid provide a high surface area, volumetrically dispersed, heat sink, the spaces within the containers and between the containers being configured to define communicating channels to equalize effects of an impressed displacement within the enclosure.

4,450,930

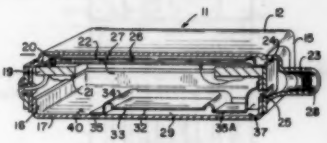
MICROPHONE WITH STEPPED RESPONSE

Mead C. Killion, Elk Grove Village, Ill., assignor to Industrial Research Products, Inc., Elk Grove, Ill.

Filed Sep. 3, 1982, Ser. No. 414,659

Int. Cl.³ G10K *13/00;* **H04R** *25/00*

U.S. Cl. 181—158 **11 Claims**



1. A microphone providing a stepped frequency response characteristic comprising: a case; a diaphragm mounted in said case to form first and second separate sound cavities therein; port means in said case for coupling external sound to said first cavity; a sound pressure responsive member positioned to define an acoustic chamber within said second sound cavity and for providing a compliance to sound couple thereto; and a sound passage coupling to said port means for coupling external sound to said acoustic chamber, said sound passage having selected dimensions for providing a resistance and inertance to the passage of sound, and said sound pressure responsive member providing a compliance and inertance whereby a selected pressure equalization is obtained in said second cavity to limit the attentuation of sounds at the lower frequencies while enabling the microphone to provide emphasis for sound at the higher frequencies.

4,450,931

STRUCTURE FOR DECREASING LOW FREQUENCY AIR VIBRATION

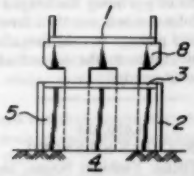
Mitsuyasu Yamashita, Tokyo; Hiroshi Igarashi, Nagoya, and Shosuke Koga, Owariasahi, all of Japan, assignors to NGK Insulators, Ltd. and Kobayashi Institute of Physical Research, both of, Japan

Filed Feb. 26, 1982, Ser. No. 352,527

Claims priority, application Japan, Mar. 9, 1981, 56-32409

Int. Cl.³ A47B *81/06;* **G10K** *11/00*

U.S. Cl. 181—198 **8 Claims**



1. A structure for decreasing low frequency air vibrations emanating from the underside of an elevated bridge and from vertical structural supports for the elevated bridge, comprising a sound insulating floor, sound insulating sidewalls and a sound absorbing ceiling arranged so as to form an air chamber below

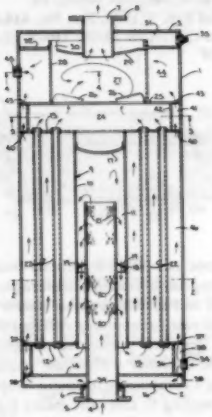
and separate from the underside of an elevated bridge's traversed surface.

4,450,932

HEAT RECOVERY MUFFLER

Mostafa M. Khosropour, Madison, and Thomas C. Learn, Stoughton, both of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Jun. 14, 1982, Ser. No. 388,430
Int. Cl.³ F16D 65/14; F16F 9/30, 9/50
U.S. Cl. 181—211 8 Claims



1. A heat recovery muffler, comprising a tubular body, a first head to enclose one end of the body, a second head to enclose the other end of said body, an exhaust gas inlet conduit for introducing exhaust gas into said body and having a downstream end disposed in said body, an annular heat exchanger disposed within said body and including an inner annular tubular member disposed concentrically outward of said inlet conduit to provide an annular passage therebetween, said heat exchanger also including a first end plate extending laterally of said tubular member and spaced from said first head to define a first chamber therebetween, said heat exchanger also including a second end plate extending laterally of said tubular member and spaced from said second head to define a second chamber therebetween, the space between said plates defining a compartment, said heat exchanger also comprising a plurality of tubes extending through said compartment between said end plates and providing communication between said chambers, a closure disposed across said tubular member and spaced from the downstream end of said inlet conduit, an outlet conduit communicating with said second chamber for discharging exhaust gas from said body, and means for flowing a heat exchange medium through said compartment to cool said exhaust gas, said exhaust gas being discharged from the downstream end of said inlet conduit and then flowing in a reverse direction through said passage to said first chamber and then flowing through said tubes to the second chamber for discharge from said outlet conduit.

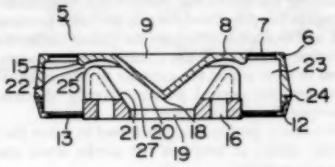
4,450,933

SUCTION SILENCER

Takashi Fukuoka, Fuchu; Yoshiaki Nagao, and Hiroyuki Tanaka, both of Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,365
Int. Cl.³ F02M 35/12
U.S. Cl. 181—229 3 Claims

1. A suction silencer comprising a mounting seat at which said suction silencer is mounted on the suction side of a machine adapted to suck gas or air, said mounting seat having therein an opening communicating with the suction port of said machine; a member defining an inversed conical surface continuous with the peripheral edge of said opening; and a lid



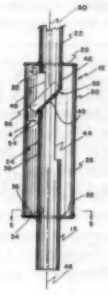
member covering the large-diameter end of said inversed conical surface with a predetermined gap left therebetween, said lid member having an inversed conical member projecting into the space defined by said inversed conical surface.

4,450,934

TRACTOR MUFFLER STRUCTURE

Max L. Davis, R.R. 3, Minneapolis, Kans. 67467

Filed Feb. 22, 1982, Ser. No. 350,889
Int. Cl.³ F01N 1/00
U.S. Cl. 181—228 7 Claims



1. A muffler structure adapted to be connected about an outlet opening on an exhaust pipe; comprising:

(a) an inlet pipe member connected to the exhaust pipe;

(b) a basic housing assembly secured to said inlet pipe member;

(c) a fluid control assembly mounted within said basic housing assembly and connected to said inlet pipe adapted to receive exhaust fluids therefrom;

(d) said fluid control assembly having a deflector plate assembly extended across a longitudinal axis and upper end of said inlet pipe member to keep fluids and foreign particles under gravity from flowing therein;

(e) said fluid control assembly having an inlet control member mounted between and to said inlet pipe member and said deflector plate assembly and an outlet control member mounted between and to said deflector plate assembly and said basic housing assembly;

(f) said deflector plate assembly extended across aligned longitudinal axis of said inlet control member and said outlet control member to control movement of gases within said basic housing assembly;

(g) said inlet control member and said outlet control member each having an exhaust opening adjacent said deflector plate assembly to direct fluids around said deflector plate assembly for subsequent movement; and

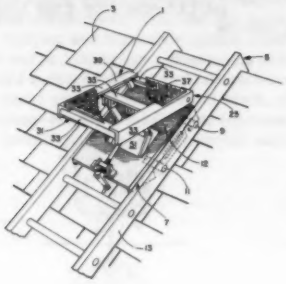
(h) said exhaust openings in said inlet control member and said outlet control member open in opposed directions for maximum efficiency.

4,450,935

PORTABLE ADJUSTABLE ROOF PLATFORM

David C. Gustavus, 1609 Dondor Dr., Fond du Lac, Wis. 54935

Filed Dec. 27, 1982, Ser. No. 453,533
Int. Cl.³ E04G 3/12; E06C 7/16
U.S. Cl. 182—45 4 Claims



1. A portable adjustable roof platform for use with a roof ladder comprising:

a generally U-shaped base having a flat frame portion and at least two supporting walls depending therefrom, each supporting wall terminating in a lower surface and being formed with an L-shaped notch opening onto the lower surface, the notch being sized slightly larger than a ladder rung, each supporting wall being formed with a generally rectangular notch opening onto the lower surface, the notch being sized substantially greater than a ladder rung and extending toward the flat frame portion and having a lower portion spaced from the L-shaped notch opening such that the openings of the L-shaped and rectangular notches receive corresponding ladder rungs simultaneously;

b. step means pivotally supported close to one end of the base;

c. a toggle mechanism linking the step means to the base and including a threaded support bar; and

d. toggle actuating means connected to the base at the end opposite the step means pivotal support,

so that actuating the toggle actuating means causes the step means to pivot relative to the base.

4,450,936

REMOVABLE STEP FOR PALLET RACK

Hubert Strom, Ft. Worth, Tex., assignor to Interlake, Inc., Oak Brook, Ill.

Filed May 18, 1983, Ser. No. 495,764
Int. Cl.³ E06C 7/08, 9/04
U.S. Cl. 182—92 11 Claims

1. In combination, a rigid, hollow, upright frame member and a removable step mounted on said frame member,

said frame member having a box-like cross-section,

pairs of horizontally spaced openings vertically disposed in a wall of said frame member, each said pair being regularly spaced an equal distance from the pair above and the pair below,

said removable step comprising a U-shaped rod, the closed end of which is bent at right angles to the plane of the U to form a support portion,

the distance between the legs of the U being equal to the distance between said horizontally spaced openings,

the legs of the U terminating in hooks, the length of said legs between said right angle bend and said hooks being equal to a multiple of the distance between adjacent pairs of openings,

said step being mounted with the legs inside the frame member, with said support portion projecting outwardly from

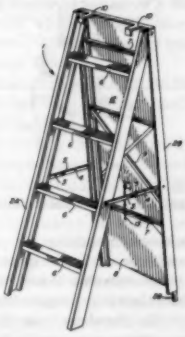
one pair of openings and said hooks being hooked over a second pair of openings below said one pair.

4,450,937

THEFT PREVENTION STEP LADDER

Ralph W. Broughton, 233 Val Vista Rd., Space 369, Mesa, Ariz. 85203

Continuation-in-part of Ser. No. 351,347, Jun. 14, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,256
Int. Cl.³ E06C 7/00, 1/36
U.S. Cl. 182—206 4 Claims



1. A step ladder for detachably mounting along the length of a permanent ladder mounted on the outside of a recreational vehicle for preventing use of the permanent ladder to gain access to the roof of the vehicle comprising:

a pair of elongated frame members hingedly connected at common ends thereof forming the top of the step ladder and when pivotally moved to an angular position, forming a free standing structure,

one of said frame members having a plurality of spacedly positioned steps arranged laterally thereof along its length,

at least one hook member mounted on the common pivotally connected ends of said frame members to extend laterally outwardly thereof,

a flat sheet mounted on said other of said frame members for covering substantially its length,

said flat sheet providing a smooth outer exposed surface, and

locking means mounted on the inside surface of said sheet for detachable engagement with the permanent ladder of a recreational vehicle,

whereby when said hook of said step ladder is mounted on the top rung of the ladder on an outside surface of a recre-

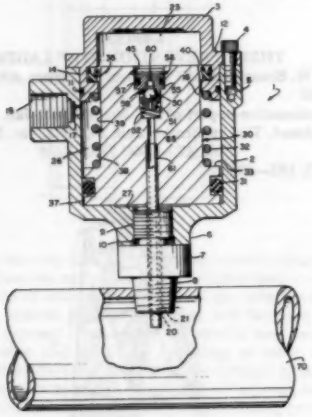
ational vehicle with said steps of the step ladder juxtapositioned to the steps of the permanent ladder, said sheet prohibits use of the rungs of the permanent ladder to gain access to the roof of the vehicle.

4,450,938

AIR LINE LUBRICATOR

Henry A. Davenport, Roanoke, and Robert E. Barrows, Fincastle, both of Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 20, 1982, Ser. No. 451,027
Int. Cl.³ F16N *11/10, 13/16*
U.S. Cl. 184—42 9 Claims



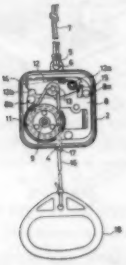
1. An air line lubricator comprising:
a hollow body having two different cross sectioned areas;
a stepped sealed piston movable in said body to form three variable chambers therein in conjunction with said body;
a first of said variable chambers towards one end of said body having the greater cross section being in communication with the air line;
a second of said variable chambers intermediate said first chamber and the third chamber formed by the smaller cross section of said piston in said greater cross section of said body;
said third chamber being formed between the smaller cross section of said body toward its other end and said smaller cross section of said piston, said third chamber being in communication with a lubricant supply;
a directional seal coacting with said smaller cross section of said body and said smaller cross section of said piston to allow lubricant to pass from said second chamber to said third chamber when said piston moves toward said one end;
a bore in said piston therethrough from said one end of said piston to the other end of the piston communicating between said first and said third chambers;
a check valve in said bore to permit lubricant flow only from said third chamber to said first when said piston moves towards said other end of said body; and
a metering means in said bore to control the rate of lubricant flow.

4,450,939

MUSIC BOX OPERATION STOPPING MECHANISM

Yoshio Kitamura, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiko Seisakusho, Nagano, Japan

Filed Aug. 3, 1981, Ser. No. 289,649
Claims priority, application Japan, Aug. 4, 1980, 55-110367[U]; Apr. 7, 1981, 56-50260[U]
Int. Cl.³ F03G *1/08;* G10F *1/06*
U.S. Cl. 185—39 17 Claims



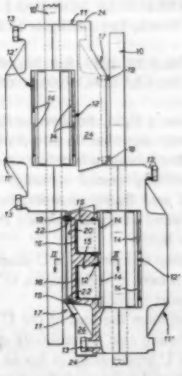
1. A coil spring winding mechanism comprising:
a coil spring;
coil spring winding means for winding said coil spring; a driven member driven by the unwinding force of said coil spring;
a locking member movable in and out of a drive region of said driven member;
an elastic member urging said locking member to move out of said drive region of said driven member; and
means for moving said locking member into said drive region of said driven member against an elastic force of said elastic member during winding of said coil spring and preventing winding of said coil spring when said locking member out of said drive region of said driven member.

4,450,940

BRAKE WITH HEAT SHIELD

Jean Herbulot, Franconville, France, assignor to Valeo, Paris, France

Filed Apr. 13, 1981, Ser. No. 253,380
Claims priority, application France, Apr. 18, 1980, 80 08699
Int. Cl.³ F16D *55/36, 65/847*
U.S. Cl. 188—71.3 4 Claims



1. A brake comprising a rotary brake member to be braked, at least one brake shoe cooperable with said rotary member, a

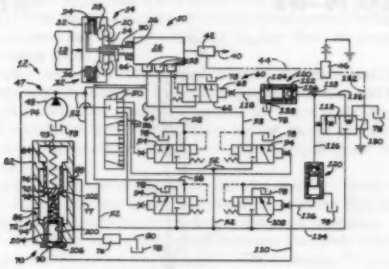
control member including a piston and cylinder control block for applying said brake shoe against said rotary member, and a stationary heat shield defining means for shielding said control block from heat radiated by said rotary member, said heat shield being carried by said control member and being disposed in direct facing spaced relation between a lateral face of said rotary member and said control block, said rotary member including a pair of axially spaced brake discs arranged parallel to each other, said control block being disposed between said brake discs for applying said brake shoe against a first of said brake discs, and said heat shield being mounted on said control block and disposed in direct facing spaced relation between the second of said brake discs and said control block, said heat shield having a flange extending axially away from said second brake disc and laterally at least partially around said control block.

4,450,941

CONTROL SYSTEM FOR CONVERTER LOCK-UP AND SIMULTANEOUS PRESSURE REDUCTION

Hugh C. Morris, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 15, 1983, Ser. No. 523,318
Int. Cl.³ F16H *45/02*
U.S. Cl. 192—3.31 **21 Claims**



1. A transmission control system (12) adapted for use with a transmission assembly (10) having a torque converter (14) for coupling a power input member (22) with a transmission speed ratio section (16), a hydraulically actuated lock-up clutch (32) arranged to selectively bypass the torque converter (14) and effectively couple the input member (22) directly with the transmission speed ratio section (16), and a source (47) of pressurized control fluid for supplying fluid to the torque converter (14) and the transmission speed ratio section (16), the system comprising:

first valve means (60) for selectively directing pressurized fluid from the source (47) to actuate the lock-up clutch (32);

second valve means (70) for controlling the pressure level between the source (47) and the transmission speed ratio section (16) to two distinct pressure levels; and

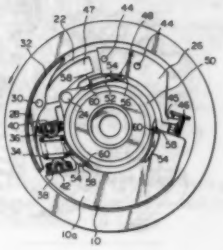
single valve means (112) adapted to simultaneously actuate the first and second valve means (60,70) to respectively actuate the lock-up clutch (32) and reduce the pressure level of the source (47) to the lower of the two distinct pressures in response to the output speed of the transmission (10) exceeding a predetermined speed.

4,450,942

VARIABLE SPEED ROTARY TORQUE TRANSMISSION DEVICE

Hideyasu Takefuta, and Akira Shinoda, both of Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,407
Claims priority, application Japan, Jul. 25, 1980, 55-104674
Int. Cl.³ F16D *21/04*
U.S. Cl. 192—48.9 **9 Claims**



1. In a variable speed rotary torque transmission device which has a driven connection with a rotary drive source and a driving connection with a load, a combination comprising:

a drive element rigidly mounted on a shaft which is operatively connected with the rotary drive source;

a first driven element freely rotatably mounted on the drive element through a bearing;

a second driven element journalled on the drive element by a bearing and having a diameter smaller than that of the first driven element;

a first clutch for locking the first drive element to the drive element for torque transmission to the load at a first speed range when the rotation of the drive element is maintained below a predetermined reference speed;

a second clutch for locking the second driven element to the drive element for torque transmission to the load at a second speed range when the rotation of the drive element is accelerated beyond the reference speed;

suppression means for suppressing frictional oscillation of the first clutch into and out of locking contact with an inner surface of the first driven element during a transition range between completely coupled and completely uncoupled conditions of the first clutch by exerting frictional resistance to the first clutch;

said first clutch comprising a centrifugal clutch which includes a centrifugal element formed as a double-arm coupling lever pivoted at a fulcrum thereof to the drive element and having an engagement surface at one end thereof, a clutch pad or shoe pivoted at a fulcrum thereof to said one end of the coupling lever and forming the engagement surface, and a pair of centrifugal weight members carried on the other end of the coupling lever, the coupling lever rocking in one direction to move the clutch shoe out of locking contact with the inner surface of the first driven element when subjected to a centrifugal force of a given magnitude corresponding to the reference speed of the drive element; and

a stop member provided to the driven element and adapted to coact with the free ends of the centrifugal weights to limit an angular movement of the coupling lever in said one direction;

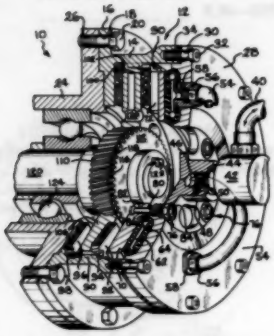
the suppression means comprising a flat spring.

4,450,943

HELICAL SPLINE CLUTCH PLATE SEPARATOR

Thomas F. Long, Jr., Maidenhead, England, assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 21, 1982, Ser. No. 341,436
Int. Cl.³ F16D *13/52, 25/063*
U.S. Cl. 192—70.2 **14 Claims**



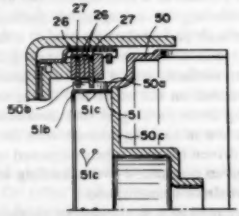
1. A clutch for selectively transferring rotary energy comprising, in combination, a first rotatable member having an array of helical splines, a clutch plate having opposed friction surfaces disposed about said first rotatable member and having an array of helical splines complementary to and engaged by said array of helical splines on said first rotatable member, a second rotatable member having an array of helical splines, first friction means secured to said second rotatable member for engaging one of said two opposed friction surfaces, second friction means for engaging the outer of said two opposed friction surfaces having an array of helical splines complementary to and engaged by said array of helical splines on said second rotatable member, and means for selectively advancing said second friction means into frictional engagement with said clutch plate and said clutch plate into frictional engagement with said first friction means, wherey engaging said arrays of helical splines urge said second fricition means, said clutch plate and said first friction means into spaced apart relationship when said selective advancing means is deactivated.

4,450,944

WET TYPE MULTIPLE DISC CLUTCH

Kazuyoshi Fujioka, Tokyo, and Shinsuke Eguchi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 11, 1981, Ser. No. 329,810
Claims priority, application Japan, Dec. 19, 1980, 55-181788[U]
Int. Cl.³ F16D *13/72, 13/74, 25/063*
U.S. Cl. 192—70.12 **3 Claims**



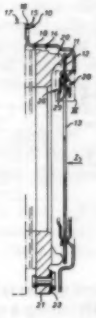
1. A wet type multiple disc clutch comprising:
a clutch drum,
a clutch hub which is a press-formed hollow cylinder and has an inward end extending into said clutch drum and a plurality of cut portions passing through the cylindrical wall of said clutch hub,
a series of first plates and second plates which are disposed around said clutch hub in said clutch drum, said first plates being, on their external circumference, engaged with said clutch drum to rotate together with said clutch drum, and each of said second plates having at least one inward projection engaged with a cut portion of said clutch hub so that said second plates and said clutch hub rotate together, and
actuating means comprising a piston disposed in said clutch drum for engaging and disengaging said first plates and said second plates thereby to connect and disconnect the transmission of rotations between said clutch drum and said clutch hub,
said clutch hub being provided with a cylindrical oil catching member which is fit in said clutch hub and has an inward flange positioned near the inward end of the clutch hub and a plurality of through holes opening into said cut portions.

4,450,945

DIAPHRAGM CLUTCH COVER ASSEMBLY

André Caray, Paris, France, assignor to VALEO, Paris, France

Filed Oct. 21, 1981, Ser. No. 313,266
Claims priority, application France, Oct. 22, 1980, 80 22545
Int. Cl.³ F16D *13/44*
U.S. Cl. 192—89 B **19 Claims**



1. A diaphragm clutch cover assembly of the type including an annular cover for mounting on a reaction plate or flywheel, a diaphragm spring having a Belleville washer peripheral portion and divided by slots into radial fingers, means for rockably mounting said diaphragm spring on said cover, a pressure plate fixed for rotation with and axially movable relative to said cover, said Belleville washer peripheral portion bearing axially against said pressure plate, said means comprising a falcrum ring disposed on one side of said diaphragm spring axially remote from said cover, and a plurality of connecting members interconnecting said fulcrum ring and said cover, the improvement wherein said connecting members comprise bosses on at least a selected one of said cover and said fulcrum ring, said bosses projecting axially toward the nonselected one of said cover and said fulcrum ring, said nonselected one of said cover and said fulcrum ring having transverse surface portions facing axially toward said diaphragm spring, said bosses having transverse free end wall portions bearing axially against and fixed to said transverse surface portions.

4,450,946

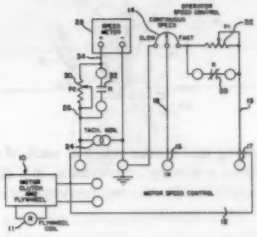
PRESS SPEED CONTROL AND INDICATION SYSTEM

Michael J. Olding, and Daniel A. Schoch, both of Minster, Ohio, assignors to Minster Machine Company, Minster, Ohio

Continuation-in-part of Ser. No. 299,735, Sep. 8, 1981, abandoned. This application Jul. 14, 1982, Ser. No. 398,362

Int. Cl.³ B30B *15/26*; B60K *41/02*

U.S. Cl. 192—0.084 **4 Claims**



1. In a mechanical press having a slide, a mechanical drive means for reciprocating the slide, a motor and drive connection means drivingly connected to a flywheel for continuously rotating the flywheel when the motor is energized, and drive means including a clutch for coupling the rotation of the flywheel to the mechanical drive means, a motor speed control and press speed indicating system comprising:

a tachometer generator means mechanically coupled to the flywheel for producing a meter energizing voltage related to the speed of the flywheel,

an operator adjustable speed adjustment means for producing on its output a variable flywheel speed control voltage corresponding to a press speed higher than its normal running speed,

a motor and drive connection control means connected between the output of the speed adjustment means and the motor and drive connection means for varying the speed at which the flywheel is driven by the motor and drive connection means in response to the flywheel speed control voltage,

a press speed meter means activated by a control voltage on its inputs for providing an indication of press flywheel speed dependent on the control voltage on its inputs,

first modifying means interposed between the speed adjustment means output and the motor control means for modifying the flywheel speed control voltage when the clutch is energized to cause the motor and drive connection control means to drive the flywheel at its normal running speed, and

second modifying means interposed between the tachometer generator means and the speed meter means activated only when the clutch is not energized for modifying the meter energizing voltage to cause the meter to indicate a speed lower than the speed corresponding to the meter energizing voltage,

said first and second modifying means being alternately activated relative to each other.

4,450,947

COMBINATION FRICTION RING AND MOUNT THEREFOR FOR CLUTCHES, BRAKES AND THE LIKE

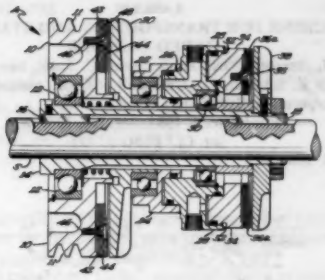
James V. Hanks, Minneapolis, Minn., assignor to Horton Manufacturing, Co., Minneapolis, Minn.

Filed Nov. 27, 1981, Ser. No. 325,597

Int. Cl.³ F16D *13/38*

U.S. Cl. 192—107 R **3 Claims**

1. A device having opposed circular members with parallel and facing surfaces for friction engagement of the members one with the other, the facing of one of said circular members having substantially rigid shoulder means formed on the outer portion of the surface thereof, a friction ring secured to the facing surface of said one circular member with the outer peripheral edge portion of the inner surface in contact with said shoulder means and the inner edge portion of the inner



surface in contact substantially with said facing surface to thereby cant slightly said lining relative to said facing surface of said one circular member.

4,450,948

APPARATUS FOR SUPPLYING HEADED PARTS

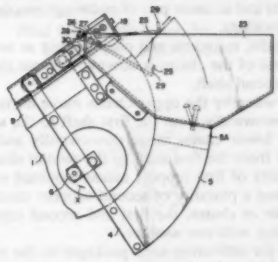
Takao Naito, Katano; Yutaka Matsuda, Moriguchi, and Yuzo Nishimori, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jan. 27, 1982, Ser. No. 343,159

Claims priority, application Japan, Jan. 28, 1981, 56-11202[U]

Int. Cl.³ B65G *47/14*

U.S. Cl. 198—389 **5 Claims**



1. An apparatus for supplying headed parts each including a shank and a head connected thereto, comprising:

a chute having a first groove receptive therein of the shanks of the headed parts while preventing entry of the heads thereof;

a pickup blade having a second groove receptive therein of the shanks of the headed parts while preventing entry of the heads thereof;

an actuator mechanism for moving the pickup blade with respect to said chute between a first position in which said second groove is out of alignment with said first groove and a second position in which said second groove is aligned with said first groove;

a hopper mounted with respect to said chute and disposed between said first and second positions for supplying headed parts into said second groove while said pickup blade moves from said first position to said second position; and

a rejector having a recess dimensioned to allow passage therethrough of the heads of said headed parts having their shanks received neatly in said second groove and slidable along said second groove when said pickup blade

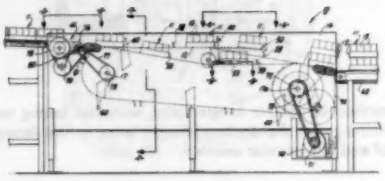
approaches said second position, whereby headed parts displaced out of position on said pickup blade can be removed therefrom by said rejector.

4,450,949

MACHINE FOR TRANSPORTING AND STACKING LOADED CARTONS

Josef J. Buschor, Los Gatos; James C. Long, San Jose, and Dieter K. Schmidt, Los Gatos, all of Calif., assignors to Five X Corporation, Santa Clara, Calif.

Filed Dec. 6, 1982, Ser. No. 335,060
Int. Cl.³ B65G *57/00*
U.S. Cl. 198—422 **4 Claims**



1. A machine for transporting and stacking packages two-high, each such package comprising a shallow tray loaded with upright containers, said machine having an entry end and an exit end and comprising:

(a) a first horizontal shaft and a second horizontal shaft at the entry and exit ends, respectively, of the machine,

(b) a pair of outer sprockets and a pair of inner sprockets on the first shaft and a pair of outer sprockets and a pair of inner sprockets on the second shaft,

(c) an outer pair of endless chains driven by the outer sprockets and an inner pair of endless chains driven by the inner sprockets,

(d) said shafts, sprockets and chains being so arranged that the course of the chains is downward from the first shaft to the second shaft,

(e) means whereby the upper chains move horizontally and then downwardly from the first shaft to the second shaft and the lower chains move downwardly and then horizontally from the first shaft to the second shaft,

(f) a plurality of first support means mounted on the outer chains and a plurality of second support means mounted on the inner chains, the first and second support means alternating with one another,

(g) means for delivering such packages to the entry end of the machine whereby the packages are deposited alternately on a first support and on a second support,

(h) means acting to restrain the forward motion of the packages moved by at least one pair of chains, and

(i) pusher means for releasing the restrained packages or packages from restraint and moving an upper package and a lower package in unison and in vertical alignment to the exit end of the machine and causing the upper package to be deposited on top of the lower package.

4,450,950

WORK PIECE TRANSFER MECHANISM

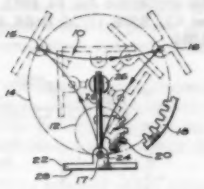
James C. Foote, Jr., York, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 12, 1981, Ser. No. 262,734
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—478 **7 Claims**

1. A transfer mechanism for moving work pieces between predetermined stations about a central axis wherein at least one of the stations includes a moving conveyance, said transfer mechanism comprising:

at least one work piece holder mounted for rotational and translational movement;

means for moving said holder along a generally hypocycloidal path about the central axis such that each point of said holder remains in a respective plane normal to the central axis, said path having a cusp adjacent to at least some of said stations; and



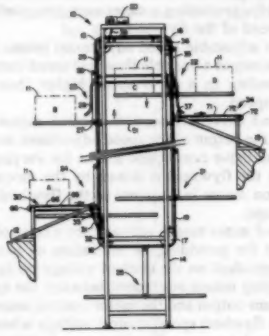
means for moving said holder when at each of said stations which includes a moving conveyance, in a direction substantially parallel to the moving conveyance to match the velocity of the conveyance.

4,450,951

CONVEYOR LIFT

Jules J. Szanati, 6857 Duffy Rd., Delaware, Ohio 43015

Filed Sep. 1, 1982, Ser. No. 413,757
Int. Cl.³ B65G *47/84*
U.S. Cl. 198—482 **10 Claims**



1. A conveyor system for transferring loads between different levels comprising:

a. a flexible endless conveyor means arranged to pass and travel over a plurality of wheels at least one of which is at a lower level and at least one of which is at a higher level;

b. drive means operable to move the endless conveyor means between and around the at least one lower and higher level wheels;

c. a plurality of carriages rotatively suspended from the endless conveyor means, each carriage having a plurality of support means projecting on opposite sides, the support means comprising in composite a platform of alternate spaces between supporting elements for the loads being conveyed by the conveyor system, the elements on each side being alternately spaced from the opposite side; and

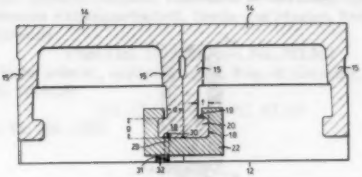
d. the flexible endless conveyor means being constructed to travel through positions which pass a portion in proximity to another portion with the elements of the support members on one side of each carriage passing through the alternate spaces between the elements of the other side of another carriage, the proximity of passing positions being such that loads on preceding carriages are transferred to succeeding carriages.

4,450,952

FIRE GRATE FOR A COMBUSTION FURNACE

Hansruedi Steiner, Wettingen, Switzerland, assignor to Widmer & Ernst AG, Wettingen, Switzerland

Filed Dec. 21, 1981, Ser. No. 332,970
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049086
Int. Cl.³ B65G 25/00
U.S. Cl. 198—773 10 Claims



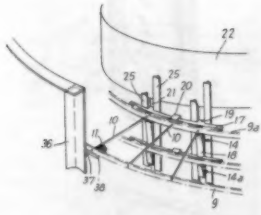
1. A fire grate for conveying a material to be burned in a combustion furnace comprising a pair of parallel spaced apart frame walls, a plurality of alternately arranged series of stationary and movable grate bars extending between and secured to said frame walls, said grate bars being formed of a plurality of grate members each having a top portion, a pair of side walls and a rib extending from each of said side walls wherein the ribs extending from the side walls of each of said plurality of grate members are being provided with inwardly extending opposed projections wherein at least two neighboring abutting grate members of said plurality of grate members are connected together by means of a clamping element removably secured to the inwardly extending projections on the ribs of the abutting side walls of said neighboring grate members.

4,450,953

HELICALLY GUIDED ENDLESS BELT CONVEYOR

Robert Le Cann, and Jean-Paul Fache, both of Reze-les-Nantes, France, assignors to Frigofrance S.A., Bouguenais, France

Filed Mar. 29, 1982, Ser. No. 362,626
Claims priority, application France, Apr. 3, 1981, 81 06789
Int. Cl.³ B65G 15/00
U.S. Cl. 198—778 10 Claims



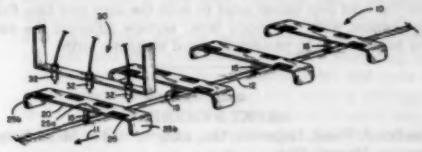
1. A helically guided endless belt conveyor including in combination, a conveyor belt having a helical portion made up of a number of spires, a plurality of T-shaped struts adjacent to the inner edge of said belt portion, each of said struts comprising a vertical bar, the lower end of which engages the upper end of a strut of the next spire below to determine the spire pitch, a helical guide means, members adjacent to the outer edge of said belt resting on said helical guide means, a central driving drum disposed within said helical portion, and a plurality of vertical grooves in said drum, each of said struts comprising a crossbar having an inwardly extending finger to provide a plurality of fingers for selectively engaging in said grooves.

4,450,954

ELECTROSTATIC SPRAY SUPPORT

William F. O'Connell, St. Charles, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed Jan. 25, 1982, Ser. No. 342,061
Int. Cl.³ B05B 5/00
U.S. Cl. 198—793 7 Claims



1. A support fixture for holding irregular shaped nonconductive articles for electrostatic paint spraying on an electrically grounded conveyor line, comprising:

(a) a nonconductive surface area conforming to said irregular shaped articles and having one side adapted for at least partially nesting against said irregular shaped articles;

(b) a conductive frame affixed to said nonconductive surface area on the side away from said one side adapted for nesting;

(c) a conductive bracket attached to said frame and adapted for mechanical and electrical coupling to said conveyor line; and

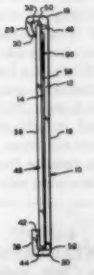
(d) a conductive surface area affixed against an irregular portion of said nonconductive surface area, and electrically connected to said conductive frame.

4,450,955

CARD HOLDER

Elmer F. Featherston, P.O. Box 4, 4981 Mt. Hope Rd., Grass Lake, Mich. 49240

Filed Dec. 4, 1981, Ser. No. 327,407
Int. Cl.³ A45C 11/18
U.S. Cl. 206—39.6 8 Claims



1. A holder for information bearing cards having front and rear faces, first and second lateral edges and a magnetic strip attached to the rear face adjacent and spaced from the card first lateral edge and substantially parallel thereto comprising, in combination, a substantially rigid body having a substantially flat wall portion defined by inner and outer surfaces, end edges and substantially parallel first and second lateral edges, said first body lateral edge including a lip folded over and spaced from the adjacent wall portion inner surface defining an open end elongated first pocket, said second body lateral edge including a lip folded over and spaced from the adjacent wall portion inner surface defining an open end elongated second pocket, a card support projection defined on said wall portion inner surface adjacent said first body lateral edge and in opposed relation to said first body lateral edge lip extending from

said inner surface toward said first body lateral edge lip a distance at least as great as the distance the magnetic strip protrudes from the card rear face, said first and second pockets receiving the card first and second lateral edges, respectively, to retain the card within said holder body wherein the card rear face is disposed in opposed relation to said wall portion inner surface, the card front face is visible substantially in its entirety, and said projection engages the card rear face adjacent the card first lateral edge to hold the card rear face from engagement with said body inner surface adjacent the card first lateral edge to protect the card magnetic strip.

4,450,956

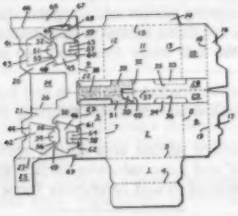
ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 297,092, Aug. 28, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 517,738

Int. Cl.³ B65D *85/40*

U.S. Cl. 206—188 **10 Claims**



1. An article carrier comprising a bottom wall, a pair of side walls foldably joined respectively to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls and extending inwardly therefrom, medial panels foldably joined respectively to the medial edges of said end wall panels at one end of the carrier and extending inwardly therefrom, handle structure joined at one end to the upper portions of said medial panels and extending upwardly therefrom, a full cell width single ply transverse partition panel struck entirely from and foldably joined to one of said medial panels and being initially disposed in a coplanar relationship therewith and being adapted to move through an angle of approximately 90° during formation of the carrier to a position extending substantially outwardly to the associated side wall, a web panel foldably joining an upper part of said transverse partition panel to said one medial panel, and an anchoring tab struck entirely from said transverse partition panel and joined thereto remote from said medial panel and being adhered to said associated side wall.

4,450,957

DENTAL CAPSULE

Gordon S. Cohen, Orange, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Jan. 18, 1983, Ser. No. 458,888

Int. Cl.³ B01F *3/12;* **B65D** *25/08, 81/32*

U.S. Cl. 206—220 **3 Claims**

1. A capsule holding a dental amalgam including a powdered component and a liquid component, said capsule comprising:

a chamber having a wall housing the powdered component and for mixing the powdered and liquid components together to form the amalgam;

a rupturable container holding the liquid component of the amalgam disposed within said chamber;

said rupturable container including a central portion which holds the liquid component and a skirt surrounding said central portion;

means for opening the chamber to remove the amalgam after the powdered and liquid components have been mixed together;

a pestle for rupturing the container and mixing together the powdered and liquid components of the amalgam when the capsule is vibrated in a dental amalgamator; and

means disposed within the chamber for holding said skirt portion of said container within said chamber and retaining the container for the liquid component within the chamber as the amalgam is removed from the chamber, said holding means including

a cylindrically-shaped sleeve having a centrally located opening larger in diameter than the central portion of said rupturable container and a wall portion provided with a lower edge in contact with the skirt portion of said container to hold the same against the wall of said chamber, whereby upon assembly of said capsule, the sleeve will not engage the central portion of said container to rupture the same, while holding the container so it can be ruptured by passage of said pestle therethrough into contact with the central portion of said container.

4,450,958

SELF-ACTUATED DENTAL CAPSULE

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Jan. 18, 1983, Ser. No. 458,991

Int. Cl.³ B01F *3/12;* **B65D** *25/08, 81/32*

U.S. Cl. 206—222 **6 Claims**

1. A self-actuated capsule for a dental amalgam, said capsule including a powdered component and a liquid component and comprising:

a chamber holding the powdered component and for mixing the powdered and liquid component together to form the amalgam, the chamber including a side wall and end walls;

a rupturable container for holding the liquid component of the amalgam, said container including a first portion holding the liquid component, a second portion securing the container along the side wall of the chamber, and a third hollow portion in communication with said first portion for allowing the liquid component to acquire sufficient

momentum to rupture the container when the capsule is vibrated in a dental amalgamator; and

means for opening the chamber to remove the amalgam after the powdered and liquid components have been mixed together.

4,450,959

PACKAGING FOR ELECTRICAL COMPONENTS

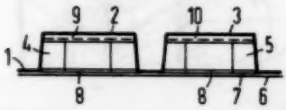
Alfons Sommer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,363

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040959

Int. Cl.³ B65D *73/02, 85/42*

U.S. Cl. 206—332 **7 Claims**



1. Packaging for single electrical components, comprising a pre-formed, one piece plastic foil having receptacles for individual components formed therein, in a single row and having edge strips beyond said receptacles a one-piece adhesive foil closing said receptacles with the components disposed therein, said adhesive foil having areas opposite said edge strips of said plastic foil, and a masking foil disposed in the vicinity of said receptacles covering the adhesive of said adhesive foil except in said areas opposite said edge strips, and said masking foil-free areas of said adhesive foil being bonded to said edge strips of said plastic foil.

4,450,960

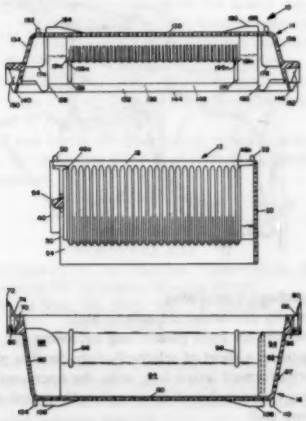
PACKAGE

Douglas M. Johnson, Chanhassen, Minn., assignor to Empak Inc., Chanhassen, Minn.

Filed Aug. 30, 1982, Ser. No. 412,980

Int. Cl.³ B65D *85/48*

U.S. Cl. 206—334 **21 Claims**



1. Package for silicon wafers comprising:

a. wafer cassette including opposing mirror-image curved sides, a plurality of vertically opposing outward extending dividers partitioning said cassette, a closed end, a substantially open H-bar configured end including a ramped top portion and a rounded bottom portion, and a partially segmented cylindrical support rod secured and positioned outward across said H-bar and including two mating buttons spaced thereon;

b. package bottom including a bottom member, four slightly geometrically configured sides, female trough surrounding a top edge of said sides, opposing end hook latches with a finger hole including a hook on each side of each of said finger holes, internal geometrically configured vertical side and end positioning members extending outwardly and upwardly from interior sides and ends for positioning of said cassette, and four pairs of orthogonal feet at each edge of said bottom member thereof; and,

c. package top including a top member, four angled sides surrounding said top, a male lip extending downwardly from said bottom of said sides for mating with each female trough, a plurality of opposing flexible independent fingers including a side groove and a top groove in each of said opposing fingers for perimeter contact mating with each wafer, internal geometrically configured vertical positioning members extending outwardly and downwardly from interior sides and ends for positioning of said cassette, hole indentations including outward extending latch on each side positioned on outer lower ends for receiving and latching said hooks of said package bottom, and a plurality of orthogonal pairs of feet on each outer top corner of said package top member whereby silicon wafers engage between said dividers of said cassette, between said cassette and said fingers of said package top, said cassette engages and interlocks between said vertical side and end members between said package top and package bottom, said package top lip engages into said package trough bottom, and said latches engage over said hook ends between said bottom and top package respectively, and said interlocking orthogonal feet providing for stacking of like packages, thereby providing secure and contamination-free environment for transportation and storage of silicon wafers and a smooth perimeter about said mated package top and bottom.

4,450,961

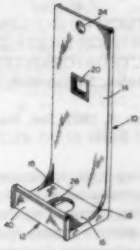
DISPLAY BRACKET FOR SOCKET DRIVE UNITS AND PACKAGE EMPLOYING SAME

Sylvester W. Bies, Bloomfield; Martin V. Fazio, Cheshire, and George Matyczyk, Southington, all of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Jul. 22, 1982, Ser. No. 400,891

Int. Cl.³ B65D *75/56, 85/20*

U.S. Cl. 206—349 **25 Claims**



1. A display bracket assembly for holding an elongated tool, comprising: a generally L-shaped bracket member including a rear wall and a laterally extending, generally planar support wall adjacent one end thereof, said rear wall having means spaced above said support wall for engaging a first portion of the tool, and said support wall having a channel extending longitudinally therethrough and inwardly from one edge

thereof for receiving a second portion of the tool; a displaceable slide member slidably engaged on said support wall of said bracket member and including a portion extending transversely of said channel along said one edge of said support wall, said element blocking said channel to thereby trap the second portion of the tool within said support wall and to thereby prevent removal of the tool when said slide member is in place; and interengaging means on said bracket member and slide member for disengageably locking them in assembly.

4,450,962

PACKAGING OR CONTAINING OF BITUMINOUS PRODUCTS

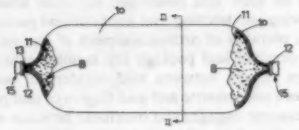
John B. Matthews, and Roger H. Keller, both of New Plymouth, New Zealand, assignors to Russell Matthews Industries Limited, New Plymouth, New Zealand

Continuation of Ser. No. 125,544, Feb. 28, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,161

Claims priority, application New Zealand, Mar. 29, 1979, 189981; Jun. 6, 1979, 190646

Int. Cl.³ B65D *75/48, 85/00*

U.S. Cl. 206—447 **21 Claims**



1. A container for packaging roading grade bitumen comprising an inner flexible casing located in intimate contact with a separate outer flexible casing, said inner casing being of a material which has a softening temperature greater than the temperature of the bitumen when the bitumen is loaded into said container but lower than the temperature at which the bitumen is applied in use, the inner casing material having a viscosity at the bitumen application temperature which enables the inner casing when melted with the bitumen to be applied therewith, the outer casing being of a plastic material which does not adhere to the inner casing, has a softening temperature which is such that melting does not occur at the bitumen application temperature, and has a strength characteristic which enables the outer casing to support and contain the inner casing during container filling with bitumen, transportation and storage, but which can be readily stripped from the inner casing to leave the bitumen contained solely within the inner casing.

4,450,963

PORTABLE PROTECTIVE HOUSING FOR SENSITIVE APPARATUS SUCH AS ELECTRICAL AND ELECTRONIC EQUIPMENT

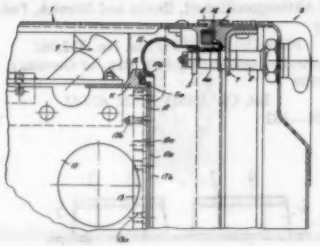
Willi Sieber, Feuerthalen, Switzerland, assignor to Edak AG, Switzerland

Filed Jun. 8, 1982, Ser. No. 386,306

Int. Cl.³ B65D *81/10, 85/38, 25/02*

U.S. Cl. 206—521 **9 Claims**

1. A housing for sensitive apparatus comprising an outer housing having an opening on at least one side, said housing having a housing frame surrounding the opening which has a housing sealing ring groove therein facing outwardly of said opening, an interior apparatus carrying frame member disposed within said housing and spaced from the interior of said housing and having an open side facing the opening of said housing, said interior apparatus carrying frame member including a frame surrounding the opening with a member sealing ring groove defined in said frame and facing outwardly of said opening, a sealing member extending between said housing frame and said member frame and including ring portions disposed in and fixed to said respective ring grooves of said frames and an intermediate bellows portion extending between said ring portions, each of said ring portions having a sealing surface facing outwardly of said opening, means for suspending said interior apparatus carrying frame member in the interior of said housing comprising resilient vibration absorbing elements, said sealing member bellows portion being substantially flat and stretched when formed and being wide enough



to permit movement of said interior apparatus carrying frame member relative to said housing to allow for vibration and to have an outwardly gently curved cross sectional shape with respect to said opening when said ring portions are fixed to said ring grooves, and a cover having a cover frame with an edge for engaging on and all the way around said sealing surface of said ring portion in said ring groove of said housing frame.

4,450,964

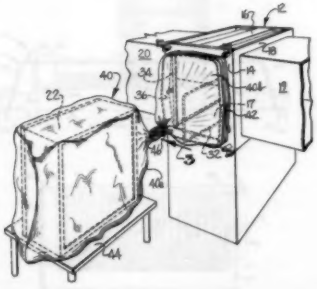
PROTECTIVE PLASTIC BAG AND METHOD OF UTILIZING THE SAME TO REMOVE ARTICLES FROM A HEPA FILTER HOUSING

Joseph A. Wood, Greenville, N.C., assignor to Flanders Filters, Inc., Washington, N.C.

Filed Feb. 22, 1983, Ser. No. 468,123

Int. Cl.³ B65D *85/00;* **G21C** *9/00*

U.S. Cl. 206—527 **13 Claims**



11. A package comprising

a potentially contaminated article, and

an essentially air tight plastic bag enclosing the article and comprising a sheet of relatively thin, flexible plastic sheet material formed into a bag, with the open end portion of the bag being gathered into a generally cylindrical configuration, and

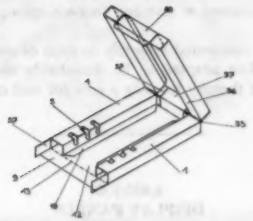
a circumferential band disposed in radial compression about said gathered end portion and maintaining the gathered portion in the form of an essentially solid, air impermeable plug having the appearance and physical characteristics of a rigid, solid rod segment of the plastic material.

4,450,965

CONTAINER FOR PHARMACEUTICAL AMPULES OR THE LIKE

Bernard Paillet, Saint-Marcel-Bel-Accueil, France, assignor to Compagnie Francaise d'Emballages et de Conditionnement - COFREC, Montelimar, France

Filed Nov. 5, 1980, Ser. No. 204,348
Claims priority, application France, Nov. 8, 1979, 79 28017
Int. Cl.³ B65D *81/02, 73/00*
U.S. Cl. 206—528 **4 Claims**



1. An improved container for pharmaceutical ampules or the like, cut from a single blank of cardboard or the like, forming a first and a second foldable unit portion, each of said first and second foldable unit portions comprising:

(a) a first and a second hollow parallel lateral support, each of said supports having a first and second end, four rectangular faces, and a rectangular cross-section; said lateral supports also having a plurality of openings adapted to receive end parts of said ampules;

(b) a flat bottom connecting together said first and second supports and forming a first of said four rectangular faces which form each said support;

(c) a plurality of articulated flaps, one of said flaps being adjoined to each respective end of said first and second lateral supports at one of said second, third, and fourth rectangular faces, said articulated flaps adapted to be folded against the ends of said lateral supports;

(d) a rectangular hinge face at the first end of said first and second supports, said hinge face being adjacent to and connected with a similar hinge face on the other of said first and second foldable unit portions and having a height substantially equal to the height of the lateral supports;

(e) a closure tab at an end of said flat bottom corresponding to the second end of said first and second supports;

(f) first, second, third, and fourth securing means;

said first and second securing means securing said rectangular hinge face to the articulated flaps located at the first end of said supports;

said third and fourth securing means securing said closure tab to the articulate flaps located at the second end of said supports.

4,450,966

SURVIVAL KIT

Enrique Villavicencio, Jr., and Enrique Villavicencio, Sr., both of Chimalpopoca 48, Iztacalco, Mexico 08620

Filed Mar. 19, 1982, Ser. No. 359,868
Int. Cl.³ C02F *1/18*
U.S. Cl. 206—547 **1 Claim**

1. A survival kit for use in combination with a canteen,

(a) said canteen including a hollow body, a base, and a neck, said body being made of flame resistant material and said neck having external threads,

(b) a receptacle for collecting moisture,

(c) said survival kit comprising:

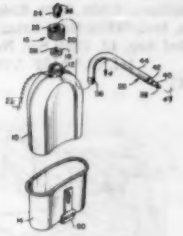
(1) a cap including a crown and a depending skirt, said crown having a passageway defined therethrough and said skirt having internal threads,

(2) a removable plug that fits within said passageway in said cap,

(3) an elongated metal tube comprised of an L-shaped outer section and plurality of smaller telescoping sections of different dimensions,

(4) said metal tube being sized at one end to fit within said passageway in said cap when said plug has been removed therefrom,

(5) the telescoping sections of said metal tube being extensible to a length several times greater than its normal, collapsed length,



(6) said metal tube, when extended, functioning to condense moisture from any steam generated within the canteen and to lead same to the receptacle for collection therein,

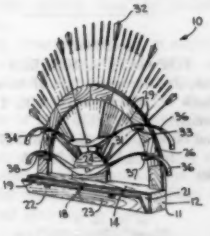
(7) said metal tube, in its normal, collapsed condition, being stored completely within the body of said canteen with the L-shaped outer section resting on the base of the canteen and the telescoping sections projecting upwardly into the neck of the canteen, whereby said metal tube can be readily extracted from the canteen for use in emergency conditions.

4,450,967

ARCHERY RACK

Robert J. Castro, 109 Dale Dr., Rockville, Md. 20850

Filed Mar. 24, 1981, Ser. No. 248,350
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—13 **12 Claims**



1. A storage rack for archery equipment including at least one pair of spaced, horizontally aligned projecting members for supporting at least one bow in a horizontal position, said projecting members being secured to and extending forwardly from means for supporting a plurality of arrows in at least two non-parallel axes, said rack being further characterized in that said means for supporting arrows comprises:

a first plurality of retaining means for the tips of said arrows disposed sequentially along a first predetermined path;

a second plurality of retaining means for the shafts of said arrows disposed sequentially along a second predetermined path;

wherein said first and second predetermined paths define

non-rectangular polygonal or circular segments up to a 180° arc of the corresponding enclosed polygon or circle members which are geometrically similar but of different sizes; and

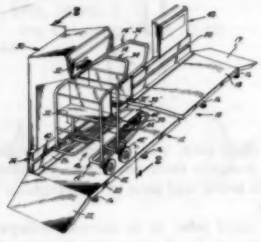
means for supporting said first and second pluralities of retaining means with said enclosed members disposed concentrically and with each arrow tip retaining means of said first plurality being radially aligned with an arrow shaft retaining means in said second plurality.

4,450,968

NESTABLE CART ANTI-REVERSING APPARATUS

James M. Muellner, White Bear Lake, Minn., assignor to Smarte Carte, Inc., White Bear Lake, Minn.

Filed Aug. 13, 1981, Ser. No. 292,357
Int. Cl.³ A47F 7/00
U.S. Cl. 211—17 **4 Claims**



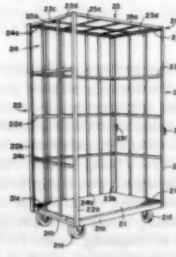
1. Apparatus for preventing reverse insertion of a nestable cart, having a pair of wheels, each mounted to a support axle spaced along an axis, onto a nesting island which includes a track having an outwardly facing wall with a slot extending longitudinally in a desired direction of nesting formed therein, wherein, during cooperative nesting, a first of the wheels travels in the track while its axle rides along the slot; said apparatus comprising a tab extending laterally from the cart proximate a second of the wheels and being positioned relative to the second wheel such that, if nesting of the cart with the second wheel traveling in the track is attempted, said tab will engage the track at an entry end thereof at a location spaced from the entrance to the slot.

4,450,969

TOP-GATE ASSEMBLY

William E. Marsh, Jr., deceased, late of New Braunfels, Tex., and by Elizabeth A. Marsh, executrix, 174 Green Valley, East, New Braunfels, Tex. 78130

Filed Nov. 9, 1981, Ser. No. 319,597
Int. Cl.³ B01D 23/24
U.S. Cl. 211—189 **9 Claims**



1. In combination with a bulk storage cart comprising a cargo bed, opposing left and right walls, back wall and top, said top including a front rail, the invention comprising:

a top-gate assembly essentially conforming to the shape and size of said top and adapted to at least partially overlie components thereof,

said top-gate assembly including a plurality of transversely extending and longitudinally spaced tubular members,

a compression spring carried in each tubular member,

forward limit stop means for said spring in each tubular member,

spring compressing means associated with each spring,

a cable connected at one end to each spring compressing means,

a foot plate connected remotely to each of said cables,

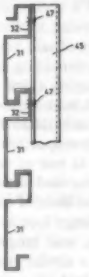
said foot plate adapted to be detachably secured to said cargo bed thereby forming a gate for said cart.

4,450,970

DISPLAY PANELS

Charles G. Shepherd, Oakville, Canada, assignor to J. A. Wilson Display Ltd., Mississauga, Canada

Filed Dec. 17, 1981, Ser. No. 332,092
Claims priority, application Canada, Sep. 11, 1981, 385666
Int. Cl.³ A47B 47/00
U.S. Cl. 211—189 **13 Claims**



1. A display panel, comprising:

a plurality of elongate horizontal panel sections and means for securing said panel sections together in vertically superimposed positions;

said panel sections being made of sheet metal and each comprising:

a front wall portion;

a rear wall portion spaced rearwardly from said front wall portion;

an intermediate portion extending from the top of said front wall portion to the bottom of said rear wall portion;

a first channel formation at the top of said rear wall portion; and

a second channel formation at the bottom of said front wall portion;

each of said panel sections except the uppermost one having said first channel formation thereof interengaged with said second channel formation of an adjacent overlying one of said panel sections defining therewith a recess extending rearwardly from the top of said front wall portion of the respective one of said panel sections and upwardly behind said second channel formation of said adjacent overlying one of said panel sections; and

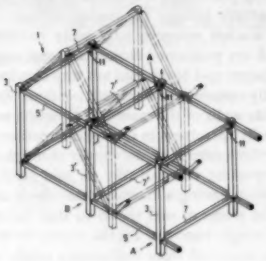
said interengaged first and second channel formations having surfaces connected in surface-to-surface contact with one another to reinforce said display panel.

4,450,971

FOLDING RACK

Mikio Kashiwabara, Tokyo, Japan, assignor to Messrs. Muse Mannequin Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,773
Int. Cl.³ A47F 5/13
U.S. Cl. 211—201 10 Claims



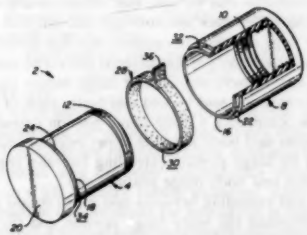
1. A folding rack comprising vertical, longitudinally spaceable, support members; longitudinally extending beam members interconnecting adjacent ones of the vertical support members; pivot connection means swingably attaching ends of the beam members to adjacent ones of the vertical support members so that said vertical support members can be moved into close together or longitudinally spaced apart relation; horizontally extending cross beam members interconnecting laterally opposite ones of the vertical support members; bracket means connecting the ends of the cross beam members to the vertical support members; said pivot connection means including a first plate fixed to an end of one beam member adjacent a vertical support member; a second plate fixed to an adjoining end of an adjacent beam member; said plates having axially projecting arms which terminate in vertical longitudinally overlapping free end portions that have transversely aligned apertures; and projections on the vertical support members positioned within the aligned apertures so that the end portions can commonly rotate on the projections whereby the adjoining beam members can swing vertically up and down about the projections to move the vertical support members into collapsed and spaced apart placement for the closed and open positions of the rack.

4,450,972

CHILD-RESISTANT CONTAINER

Clarence W. Wieland, 1531 Hyde St. #8, San Francisco, Calif. 94109

Filed May 31, 1983, Ser. No. 499,120
Int. Cl.³ B65D 55/02
U.S. Cl. 215—221 12 Claims



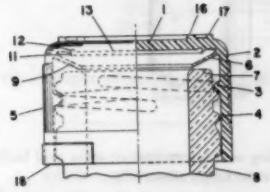
1. A child-resistant container comprising:
a receptacle having an open top;
a cap configured for covering said open top;
rotational engagement means for securing said cap to said receptacle;
said receptacle and cap having juxtaposed external grooves formed about their respective outer surfaces, said grooves bounded by juxtaposed groove surface portions of said outer surfaces; and
means, removably mounted within said grooves, for inhibiting relative rotary motion between said cap and said receptacle.

4,450,973

CLOSURE FOR PRESSURIZED CONTAINERS

Thurston Toeppen, Lois La., R.D. 3, Poughkeepsie, N.Y. 12603

Filed Sep. 28, 1982, Ser. No. 425,758
Int. Cl.³ B65D 53/00
U.S. Cl. 215—329 4 Claims



1. A closure device molded of resilient material, for use with a container having an external screw thread about a cylindrical outlet and a rim perpendicular to said thread, comprising: a circular crown member, a cylindrical sidewall depending from said crown member and perpendicular to it, an internal screw thread within said sidewall to mate with said external thread, and multiple sealing means integral with the lower surface of said crown member for cooperation with said rim, said multiple sealing means comprising:
a first sealing means in the form of a ridge concentric with said sidewall and having a generally triangular cross-section, dependent from said crown member and having a crest diameter substantially equal to the mean diameter of said container rim:
a second sealing means in the form of a frusto-conical flexible flange dependent from the juncture of said crown member and said sidewall, and having an inner rim diameter substantially smaller than the diameter of said first sealing means:
said first sealing means comprising in addition to said ridge a circular groove directly inside of it, said ridge being asymmetrical and having its crest closely adjacent to said groove, the volume of said groove above the adjacent lower surface of said crown member being substantially equal to the volume of said sealing ridge below the same lower surface, said ridge volume being so related to the resilience of said molded material that when subjected to a normal axial working load said ridge will be substantially displaced into said groove.

4,450,974

LITTER CONTAINER

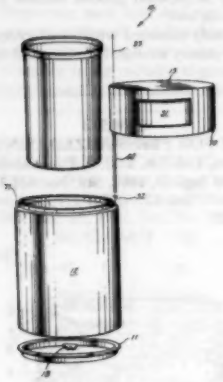
Joseph Winden, Grand Rapids, Mich., assignor to Urban Systems Streetscape, Inc., Grand Rapids, Mich.

Filed Sep. 17, 1982, Ser. No. 419,148
Int. Cl.³ B65D 43/18, 23/00
U.S. Cl. 220—1 T 19 Claims

1. A litter container for use in an urban environment comprising:
a base having inner and outer diameters;
means for securing said base to a support surface disposed on said inner diameter;
a body disposed atop said base for receiving a litter recepta-

cle, and shielding said means for securing said base from the view of the ordinary observer;

means for securing said body to said base disposed on said outer diameter and engaging the underside of said body



for shielding said means for securing said body from the view of the ordinary observer;

a top; and

means for pivotally mounting said top on said body.

4,450,975

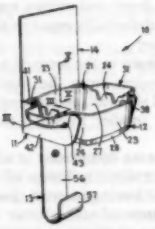
WALL-MOUNTED ASH TRAY

William T. Glass, and Michael T. Glass, both of Kalamazoo, Mich., assignors to Mark Designs International, Inc., Kalamazoo, Mich.

Filed Mar. 2, 1982, Ser. No. 354,002

Int. Cl.³ B65D *25/22;* **A24F** *19/00*

U.S. Cl. 220—18 **4 Claims**



1. In a wall-mountable ash tray assembly having a bracket mountable on a vertical support surface and an ash tray removably supported on the bracket, comprising the improvement wherein:

said bracket comprises a one-piece U-shaped member having a substantially planar bight which overlies the support surface and a pair of substantially parallel planar arms which are fixed to opposite ends of the bight and project horizontally forwardly therefrom in substantially perpendicular relationship thereto, said bracket being integrally formed in one piece from a thin sheetlike material so that the bight and arms are of substantial height, each said arm having a shallow horizontally elongated recess formed therein and extending longitudinally thereof, said recess being located intermediate the ends of the respective arm and opening upwardly through the top edge thereof so that each arm has an upwardly opening U-shaped configuration, said shallow recess being elongated in the longitudinal direction of the respective arm and being defined by a substantially straight bottom edge, said arms terminating in free ends which are rounded, said free ends being positioned so as to not project forwardly beyond the front wall of the ash tray; and

said ash tray including a main receptacle portion having an upwardly-opening boxlike configuration, said main body portion being positioned between said arms so as to substantially wholly occupy the region defined within said U-shaped bracket whereby said body portion has side walls which are positioned closely adjacent said arms and closely adjacent said bight, said ash tray also having a pair of upwardly-opening cup-shaped portions fixed to the opposite side walls of the main body portion and projecting outwardly therefrom in opposite directions, said cup-shaped portions extending outwardly through said recesses for supporting said ash tray on said arms, said cup-shaped portion having a cross section which closely conforms to the shape of said recess so that the cup-shaped portion is snugly confined by the recess so that the ash tray can be removed from the bracket solely by upward displacement of the ash tray relative to the bracket.

4,450,976

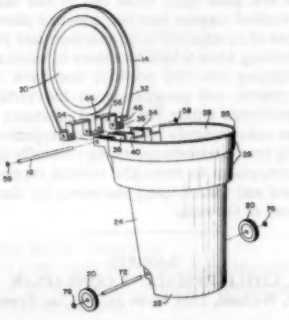
WHEELED MOLDED CONTAINER WITH HINGED LID

Larry L. Snyder, and Richard Florer, both of Lincoln, Nebr., assignors to Snyder Industries, Inc., Lincoln, Nebr.

Filed Feb. 22, 1982, Ser. No. 350,874

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—343 **15 Claims**



1. A portable molded container with a hinged lid comprising:

a container body having a bottom and an upstanding sidewall joined to said bottom, said bottom and said sidewall defining a container interior, and said sidewall having an upper edge defining an opening into said interior;

a lid having a cover portion adapted to overlie said opening;

at least two transversely spaced hinge means for pivotally interconnecting said lid and said body, each of said hinge means comprising a body hinge portion extending laterally from said body near the upper edge of said sidewall, and a lid hinge portion extending laterally from said lid adjacent said body hinge portion; and

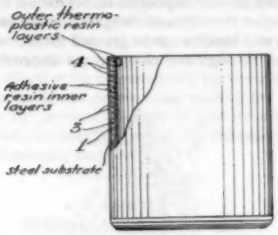
a hinge rod extending between said hinge means and pivotally coupling the body hinge portion and the lid hinge portion of each of said hinge means, said hinge rod being rotatable with respect to each of said hinge portions and exposed in the region between said hinge means so that it can be grasped and function as a handle for manipulating the container.

4,450,977

MANUFACTURE OF DRAW-REDRAW CANS USING FILM LAMINATED OR EXTRUSION COATED STEEL SHEET MATERIAL

Lyle W. Colburn, Newark; Craig W. Potter, Findlay, and Floyd E. Romesberg, Granville, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 2, 1981, Ser. No. 250,355
Int. Cl.³ B65D 90/04
U.S. Cl. 220—458 10 Claims



8. A drawn food or beverage container (A) which is made of a laminated or extrusion coated steel sheet comprising a steel sheet having adhered to both major surfaces thereof a multilayered synthetic thermoplastic resin coating comprising an adhesive synthetic thermoplastic resin inner layer which is composed of at least a major proportion of a normally solid random copolymer of ethylene with from about 1 to about 30 weight percent, based upon said copolymer, of an ethylenically unsaturated carboxylic acid monomer and which copolymer is bonded on one side directly to the surface of said steel sheet and is adhered on its other side to an outer layer of a synthetic thermoplastic polymer resin having a crystalline melting point of at least about 250° F. and (B) which has been post-baked after its formation but prior to its use in food or beverage canning operations at a temperature above the crystalline melting point of the highest melting point resin employed in said thermoplastic resin coating for a period of time sufficient to relieve the stress created in such coating during the formation of said container; said container having been formed by a draw-redraw can forming process.

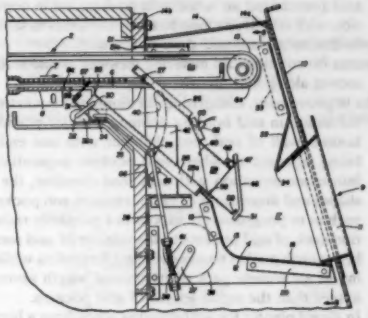
4,450,978

APPARATUS FOR RETRIEVING PAPER MONEY BILLS PRESENTED BUT NOT PICKED UP AT AUTOMATIC TELLER MACHINE BILL DELIVERY STATION

Harry T. Graef, Massillon; Scott A. Mercer, Hanoverton; Jeffrey A. Hill, Canton; Kevin H. Newton, North Canton, and John C. Bozzelli, Tallmadge, all of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Aug. 4, 1982, Ser. No. 405,057
Int. Cl.³ G07F 11/00
U.S. Cl. 221—13 24 Claims

1. In an ATM dispenser having a reversible belt conveyor a retrival mechanism for unpicked paper money bills dispensed by the ATM dispenser mechanism and discharged from the delivery end of said dispenser mechanism's reversible belt conveyor to a bill delivery station including, a bill receiving and presentation tray mounted for movement at said delivery station between a normal position receiving bills discharged by said conveyor for customer removal, and a retrieval position for withdrawal from the tray of unpicked bills thereon by said conveyor belt delivery end when the conveyor is reversed; drive means for moving the tray between normal and retrieval positions; sensor means operative, when sensing unpicked bills on the tray when in normal position, to energize the drive means to move the tray to retrieval position; and means for



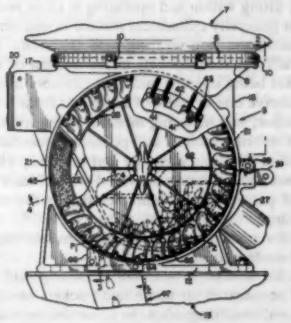
reversing belt conveyor movement upon energizing said drive means.

4,450,979

SEED METERING MEANS

Harry C. Deckler, South Bend, Ind., assignor to White Farm Equipment Company, Farmington Hills, Mich.

Continuation of Ser. No. 178,532, Aug. 15, 1980, abandoned.
This application Sep. 27, 1982, Ser. No. 424,835
Int. Cl.³ A01C 7/04
U.S. Cl. 221—263 4 Claims



1. In a seed planter for withdrawing seeds from a hopper and depositing the seeds into an underlying furrow at regular intervals, a seed metering apparatus including:

a housing having a side opening framed by an upright circumferential rim with the lower portion of said opening defining a seed chamber;

means comprising a drop chute depending from said housing for discharging seeds into said furrow;

gravity feed means for conveying seeds from said hopper to said seed chamber;

a disc-shaped seed metering member having an inwardly-facing surface with a circumferential margin and a periphery rotatably fitting within said rim and having a plurality of seed pockets in the margin of said disc each dimensioned to receive a predetermined one or more number of said seeds, said metering member being rotatably mounted so as to bring each of said pockets sequentially in communication with said chamber and said drop chute, and each of said pockets being porvided with at least one pressure-relief passageway communicating to the outside of said housing;

means for supplying pressurized air to said seed chamber to urge said seeds into said pockets;

means for at least substantially isolating said pockets from said pressurized air while said pockets are in communication with said drop chute to allow the seeds in said pockets to discharge into said drop chute; and,

means for rotating said metering member as said seed planter moves along said furrow;

the improvement, comprising, an elongated pocket-exposing formation in said housing defining a major portion of the bottom wall of said seed chamber with one end thereof being adjacent to where said pockets sequentially enter into communication with said seed chamber, the relative shapes and dimensions of said formation and pockets being such as to progressively expose in a primarily radial direction each of said pockets to the interior of said seed chamber as each pocket passes over said formation while traveling in an arcuate path of substantial length several times longer than the radial length of said pockets.

4. In a seed planter for withdrawing seeds from a hopper and depositing the seeds into an underlying furrow at regular intervals, a seed metering apparatus including:

a housing having a side opening framed by an upright circumferential rim having an inner generally cylindrical surface with the lower portion of said opening defining a seed chamber;

means comprising a drop chute depending from said housing for discharging seeds into said furrow;

gravity feed means for conveying seeds from said hopper to said seed chamber;

a disc-shaped seed metering member having an inwardly-facing side surface with a circumferential margin and a periphery with a generally cylindrical outer surface rotatably fitting within and operating in close proximity to said inner generally cylindrical surface in said rim so as to form a pneumatic non-wearing seal therewith and having a plurality of seed pockets in the margin of said disc each pocket being open to said seed chamber and dimensioned to receive one or more of said seeds from within said seed chamber, said metering member being rotatably mounted so as to bring each of said pockets sequentially in communication with said chamber and said drop chute, and each of said pockets being provided with at least one pressure-relief passageway communicating to the outside of said housing;

means for supplying pressurized air to said chamber to urge said seeds into said pockets;

means for at least substantially isolating said pockets from said pressurized air while said pockets are in communication with said drop chute to allow the seeds in said pockets to fall into said drop chute; and

means for rotating said metering member as said seed planter moves along said furrow;

said upright circumferential rim and said pneumatic non-wearing seal being co-incidally discontinuous over the upper end of said drop chute so as to allow seeds to discharge from said pockets into said chute;

and, said seed pockets being open at the periphery of said seed disc so that seeds discharge radially therefrom into said upper end of said drop chute.

4,450,980

DISPOSABLE RAZOR DISPENSER

Merlyn L. Clabby, deceased, late of Upland, Calif., and Patrick J. Sheppard, executor, 920 8th St., Zephyrhills, Fla. 34248

Continuation of Ser. No. 172,454, Jul. 25, 1980, abandoned. This application May 3, 1982, Ser. No. 374,491

Int. Cl.³ A47F *1/08*; B65D *83/00, 65/32, 71/00*

U.S. Cl. 221—281 **5 Claims**

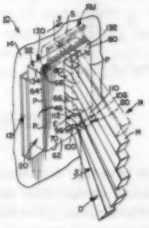
1. An improvement in a device for dispensing disposable razors, the device comprising:

a housing having a back, sides and a front, said front having an elongate slot defined therein for slidably accommodating disposable razors in a stacked configuration;

a retainer shelf mounted on said back to be located adjacent said slot, said shelf being positioned to support a disposable razor thereon while such razor is accommodated in said slot;

dispensing slot defining means on said retainer shelf for guiding disposable razors out of said elongate slot and out of said housing;

said housing front, sides and back defining a chamber in which the heads of disposable razors are positioned so that the handles of such disposable razors extend outwardly of said chamber through said elongate slot into an orientation wherein said handles can be grasped for moving a disposable razor through said elongate and dispensing slots;



the improvement comprising:

a mounting means which is securely affixed to a wall and which includes a hollow backing member;

a mounting means engaging means securely affixed to said housing and which is releasably received in said hollow backing member to releasably mount said housing onto a wall; and

ledge means on said housing for mounting a razor between uses of such razor;

said improvement further including side members attached to said housing front and which have holes defined therein, said improvement further including tabs on said housing sides which are accommodated in said side member holes to attach said housing front to said housing sides.

4,450,981

PRECISION MATERIAL FILLING SYSTEMS

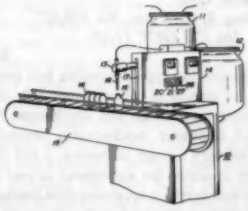
David E. Haig, Erdenheim, Pa., assignor to Abe Jacobs, Philadelphia, Pa.

PCT No. PCT/US79/00098, 371 Date Feb. 26, 1979, 102(e) Date Feb. 26, 1979, PCT Pub. No. WO80/01797, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 22, 1979, Ser. No. 293,891

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—61 **28 Claims**



1. A precision material filling system characterized by,

(a) a dispensing tank containing a flowable dispensable product,

(b) dispensing means associated with the dispensing tank for dispensing product from said tank, said dispensing means comprising,

(1) an actuatable product dispenser actuatable in a first way to permit flow of product therethrough for dispensing, and actuatable in a second way to terminate flow of product therethrough,

(2) actuatable timer means operatively coupled to said actuatable product dispenser and effective each time actuated to actuate said product dispenser in said first way and after a predetermined time interval to automatically actuate said product dispenser in said second way, said timer means including means for selectively setting said predetermined time interval,

(3) control means for actuating said timer means, and

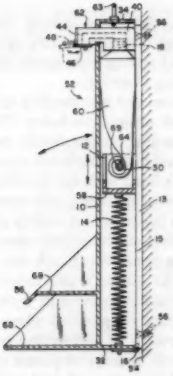
(c) pressurizing means operatively coupled to said dispensing tank effective for pneumatically pressurizing the product in said tank, said pressurizing means being effective to maintain the product pressure at said dispensing means substantially constant irrespective of the product quantity in said dispensing tank.

4,450,982

TOOTHPASTE DISPENSER

Americo S. Ferreira, 40 Canoe Place Rd., Apt. #1, Hampton Bays, N.Y. 11946

Filed Jul. 22, 1982, Ser. No. 400,626
Int. Cl.³ B65D *35/24*
U.S. Cl. 222—93 **8 Claims**



1. A toothpaste dispenser comprising:

a housing adapted to be vertically mounted to a wall;

a vertically sliding track located inside of and fixed to the rear surface of said housing;

an open topped conveyor traversing said vertically sliding track;

a biasing means connecting the bottom surface of said open topped conveyor to the base of said housing whereby resistance is provided as said open topped conveyor moves upwardly along and traverses vertically said sliding track;

means for receiving a dispensable tube placed vertically inside said housing, comprising having its threaded end engaged in the first end of a "U" shaped sleeve located in the upper section of said housing while having its lower end engaged around a ratchet means located in said open topped conveyor; and

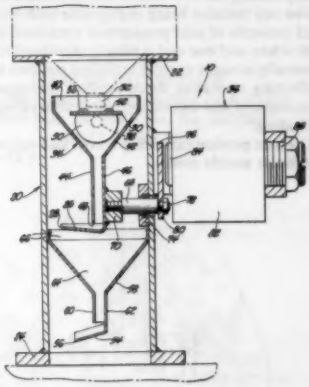
a knob rotatably fixed to said ratchet means whereby its rotation causes said open topped conveyor to traverse upward on said vertically sliding track whereby said lower end of said dispensable tube wraps around said ratchet means, thereby discharging contents of said dispensable tube into said sleeve through an outlet located at second end of said sleeve and into the ambient.

4,450,983

POWDER DISPENSING ASSEMBLY

Michael J. Goodrich, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Jul. 26, 1982, Ser. No. 401,790
Int. Cl.³ B65G *69/00*
U.S. Cl. 222—196 **20 Claims**



1. A powder dispensing assembly (10) comprising; support structure (20), a dispensing platform (26) supported by said support structure (20) for receiving powder and having a distal lip (28) over which particles of powder move to define a falling curtain of powder particles, a supply platform (30) supported by said support structure (20) for receiving powder and supplying the powder to said dispensing platform (26), flow control means (34) for establishing a flow path of the powder from said supply platform (30) to said dispensing platform (26), drive means (36) for vibrating said dispensing platform (26) to move particles thereover and over said lip (28) and for moving said supply platform (30) in unison with said dispensing platform (26) to move powder from said supply platform (30) and through said flow control means (34) to said dispensing platform (26), a shelf (54) disposed below said lip (28) for receiving the powder from said lip (28), said shelf (54) being stationary and extending downwardly to a distal edge (56) at an inclined angle sufficient for the powder to flow thereover under the force of gravity and over said edge (56), the shelf (54) provides a vibration-free surface by which pulsed groups of powder particles flowing towards the shelf (54) are smoothed out forming a uniform curtain of powder particles thereafter when the powder particles flow from the shelf (54).

4,450,984

VISCOUS FLOW TILT VALVE FOR PRESSURIZED CONTAINER

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Aug. 5, 1982, Ser. No. 405,696
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.22 **24 Claims**

1. A fluid dispensing valve structure for dispensing the viscous contents of a pressurized container comprising:

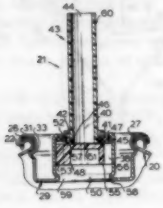
a valve mounting cup member peripherally sealingly securable to said pressurized container and having generally continuous walls with a central aperture defined therein, said continuous walls defining an interior valve receiving chamber adjacent to said central aperture,

a resilient seal member carried within said mounting cup member radially adjacent said central aperture,

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second opposed and outwardly flanged end extending through said central aperture and supported in said mounting cup member by said resilient seal member in a normally generally straight upright extended position,

a moveable valve cup member longitudinally reciprocally slidably carried within said valve receiving chamber adjacent side portions thereof and normally biasable against said resilient seal member to form a seal means for normally sealing the contents of said container, said moveable valve cup member being engageable with said second end, said contents of said pressurized container being dispensable when said one end is tiltably displaced relative to said generally straight upright extended position by an external deflecting operating force applied thereagainst, thereby opening said seal means, said moveable valve cup member including:

(A) a base portion extending across said second end of said tubular nozzle means,



(B) annular rib means upstanding from said base portion for engaging said resilient seal member peripherally of said tubular nozzle means,

(C) guidance means for orienting said moveable valve cup member relative to said valve receiving chamber for stable reciprocal sliding movements of said moveable valve cup member longitudinally along said continuous walls,

(D) channel means defined by said moveable valve cup member and longitudinally extending therethrough and terminating peripherally of said annular rib means and adapted for the laminar flow of a viscous fluid therethrough, said channel means having an effective cross-sectional area therealong which is at least equal to the effective cross-sectional area of said tubular nozzle means,

the interrelationship between said moveable valve cup member, said tubular nozzle means, said resilient seal member, and said valve mounting cup member being such that a substantially unobstructive and non-turbulent flow of said contents through said valve structure can occur when said one end is so tiltably displaced.

4,450,985

RECLOSABLE VALVE WITH SEPARATE INTERNAL SEAL MEANS AND SEAL REMOVING MEANS THEREFOR

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Nov. 18, 1982, Ser. No. 442,636
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.22 **30 Claims**

1. In a fluid preassemblable valve structure of the type suitable for dispensing the contents of a pressurized container associatable therewith, said valve structure comprising:

a valve mounting cup peripherally sealingly securable to said pressurized container and having generally continuous wall projections extending generally internally into said container and defining an interior valve receiving chamber with a medial upper portion having a central aperture defined therein;

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second end extending through said central aperture;

a resilient valve seat means positioned in said valve receiving chamber;

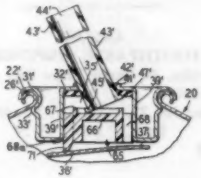
a moveable valve means positioned in said valve receiving chamber and biasable against said valve seat means to close and seat said valve structure;

said tubular nozzle means being moveable responsively to force applied to said one end so that said second end unseats said moveable valve means to open said valve structure;

the improvement which comprises in combination:

a sealing plate means positioned across said wall projections and closing said valve receiving chamber;

a releasable bonding means adhering said sealing plate means to adjacent portions of said wall projections in gas tight



relationship, and adapted to release said sealing plate means from said wall projections responsively to pressure applied against said sealing plate means from a location in said valve receiving chamber;

said sealing plate means and said bonding means in combination with said wall projections being effective to isolate said contents from said tubular nozzle means, said valve seat means, and said moveable valve means,

engaging means associated with said moveable valve means for abutting against said sealing plate means; and

the interrelationship between said sealing plate means, said tubular nozzle means, said moveable valve means, and said releasable bonding means being such that an initial movement of said tubular nozzle means moves said moveable valve means with said associated engaging means against said sealing plate means to permit a release of said bonding means and a separation of said sealing plate means from said wall projections, thereby to permit operable association between said contents and said valve structure for dispensing said contents.

4,450,986

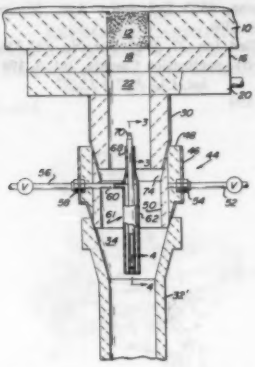
APPARATUS FOR UNPLUGGING A VESSEL DISCHARGE PORT

Michael F. Harasym, 125 E. Hathaway La., and Benjamin A. Lanza, 2407 Merwood La., both of Havertown, Pa. 19083

Filed Jul. 9, 1982, Ser. No. 396,947
Int. Cl.³ B22D *41/10*
U.S. Cl. 222—591 **7 Claims**

1. Apparatus for unplugging a discharge port comprising an annular member having a refractory inner surface, a housing supported within said member and generally coaxial therewith, a conduit extending from the exterior of said member to the interior of said housing, a tube guided for upward movement by said housing, an opening at the upper end of said tube, said tube having a reaction surface within said housing and adapted

to be projected upwardly by gas introduced into the housing from said conduit, said tube having passage means so that gas



from said housing may enter the tube and discharge through said opening.

4,450,987

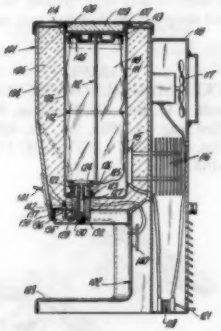
PORTION CONTROL LIQUID DISPENSER

William C. Boettcher, Foley; Richard B. Volkmer, Wentzville, and Wayne R. Wehde, Winfield, all of Mo., assignors to D.O.V.E. Equipment Corporation, Winfield, Mo.

Continuation-in-part of Ser. No. 87,986, Oct. 25, 1979, abandoned. This application Apr. 17, 1981, Ser. No. 255,278

Int. Cl.³ B67D *3/00*; G04C *23/38*

U.S. Cl. 222—641 **12 Claims**



1. A portion control liquid dispenser comprising:

a tank having a central cavity and an aperture in the base thereof,

a housing mounted within the tank cavity and having a removable collapsible container for liquid mounted thereto and extending to the base of the housing having at the bottom thereof a female fitment including an aperture extending therethrough,

a male fitment having a central aperture and an upwardly protruding portion design to frictionally engage the aperture in the female fitment, and a downwardly extending orifice stem,

a dispensing tube in fluid-flow communication with said stem at its upper end and extending through the tank cavity at its lower end,

a resilient nipple having a central aperture mounted to the end of the dispensing tube,

a movable metal plunger mounted within the tube and having a lower end to engage the aperture in the nipple in an inactivated condition and prevent the flow of liquid therethrough,

a solenoid coil mounted about the dispensing tube, and,

a switch and a power supply coupled through said switch to the solenoid coil to activate said coil for a predetermined interval causing said plunger to move upwardly within the dispensing tube to dispense fluid through the nipple orifice; whereby the dispenser is rendered nondripping and sanitary by allowing said male fitment, dispensing tube, resilient nipple and movable metal plunger to be readily removed and cleaned of food products and/or other contaminants.

4,450,988

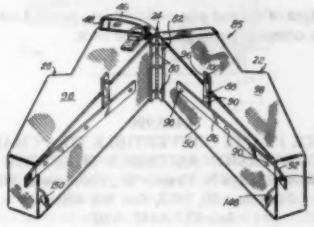
BICYCLE BAG SYSTEM

Mark Meisel, 948A Banta Pl., Ridgefield, N.J. 07657

Filed Mar. 29, 1982, Ser. No. 362,901

Int. Cl.³ B62J *9/00*

U.S. Cl. 224—32 A **11 Claims**



1. Apparatus for a bicycle or the like for supporting a pair of bags, one on either side of a wheel of said bicycle, said apparatus comprising:

a frame assembly, said frame assembly including first and second support means for supporting said bags, each support means having an upper edge, and means for hingedly securing said support means together along said upper edges thereof, whereby said support means are relatively pivotable about said hinge means for varying the spacing therebetween;

means for securing said pair of bags to said frame assembly with one bag extending from each of said support means; and

means for removably securing said frame assembly to said bicycle in the vicinity of the axle of said wheel with said first and second support means on either side of said wheel and said hinge means disposed outside the circumference thereof, the variable spacing between said support means accommodating use on bikes or the like having different axle lengths, whereby said frame assembly is securable to said bicycle for transporting said bags thereon and removable from said bicycle whereupon said support means are pivotable about said hinge means into close confronting relation for optionally carrying said bags as a unit.

4,450,989

GUN RACK FOR MOTOR VEHICLES

Earl M. Bogar, Jr., P.O. Box 4152, Houston, Tex. 77210

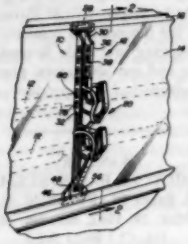
Filed Jul. 8, 1981, Ser. No. 281,484

Int. Cl.³ A47F *5/08*, *7/00*

U.S. Cl. 224—42.45 R **17 Claims**

1. A rack for supporting guns comprising an upper component and a lower component each having an end plate for engagement with a supporting structure, means connecting adjacent ends of the components, and means on at least one of the components for supportingly engaging a gun each of said end plates being relatively thin and provided with laterally

extending side edges, hinge means connecting the laterally extending side edges to the remainder of the end plate to enable



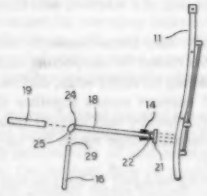
the side edges of the end plates to fold into parallel relationship to provide compact packaging of the rack.

4,450,990

BACKPACK FRAME CONVERTIBLE TO A CHAIR AND CONVERSION ASSEMBLY THEREFOR

James J. Bolstad, 3526 N. Cramer St., Shorewood, Wis. 53211

Filed Sep. 30, 1982, Ser. No. 430,038
Int. Cl.³ A45F *4/02*
U.S. Cl. 224—155 **8 Claims**



1. In a backpack frame comprising a pair of generally vertically disposed, contoured tubular side frame members, two bowed cross members interconnecting the side frame members to form a generally rectangular frame having a front face adapted to conform to the back of the wearer, and a tubular U-shaped frame extension demountably attached by its free ends to the upper ends of the side frame members, an assembly for converting the backpack frame to a chair comprising:

(a) a pair of seat tubes each including first connector means attached to one end;

(b) each first connector means adapted to be attached to the lower portion of the front face of one side frame member to separate the same into the chair back and rear leg portions, and to hold the seat tubes in spaced parallel relation extending generally perpendicularly from the side frame members:

(c) a flexible seat member attached to and extending between the seat tubes; and,

(d) second connector means for demountably attaching the free ends of the frame extension to the other ends of the seat tubes to extend downwardly therefrom and form the chair front legs.

4,450,991

FABRIC MADE CHAIR FOR FACILITATING TRANSPORTATION OF A DISABLED PERSON

Jacques Gougeon, 4533 Delorimier Ave., Montreal, Quebec, Canada H2H 2P4

Filed Jan. 27, 1982, Ser. No. 343,316
Claims priority, application Canada, Jul. 6, 1981, 381201
Int. Cl.³ A47D *13/02*
U.S. Cl. 224—159 **8 Claims**

1. A carrying device comprising:

(a) a piece of flexible material forming seat means, said seat means having two ends;

(b) a first strap means joined to said seat means at one end thereof, said first strap means having two ends, said two ends provided with loop pile and hook fasteners;

(c) a second strap means joined to said seat means, said second strap means having two ends provided with loop pile and hook fasteners; and

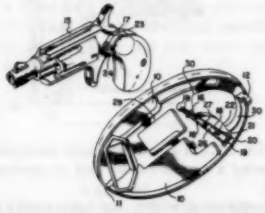
(d) handle means joined to said seat means at the other end thereof, said handle means having two extended ends, each of said ends being joined to said second strap means at a point substantially intermediate each of said ends of said second strap means and said seat means.

4,450,992

BELT BUCKLE-MINI-REVOLVER COMBINATION

Richard J. Casull, P.O. Box 276, Freedom, Wyo. 83120

Filed Aug. 19, 1982, Ser. No. 409,546
Int. Cl.³ A44B *11/00*; A45C *11/00*
U.S. Cl. 224—163 **6 Claims**



1. A belt buckle adapted to have a small handgun releasably mounted to the front face thereof, said belt buckle comprising:

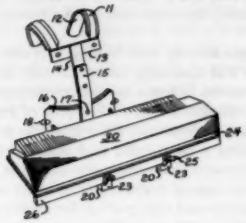
a buckle plate having an indented area on the front face thereof, said indented area being shaped for reception of a small handgun flatwise therein;

an opening in the indented portion of the buckle plate, said opening being adapted to receive a stud which is attached to and extends from the side frame of the handgun;

spring clasp means attached to the back face of said buckle plate and positioned adjacent to said opening, said spring clasp means being adapted to releasably engage the free end of said stud when said stud is received in said opening; and

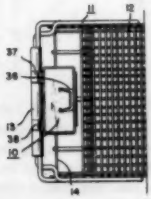
release means adapted to release said spring clasp means when it is desired to remove the gun from the buckle.

4,450,993
KEYBOARD CARRIER
Bernard Ephraim, 1014 E. Olive St., Decatur, Ill. 62526
Filed Sep. 28, 1982, Ser. No. 425,439
Int. Cl.³ G10G *5/00*
U.S. Cl. 224—265 **9 Claims**



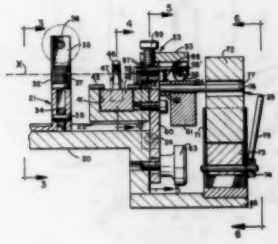
1. In a keyboard carrier having a brace and plate assembly attachable over the shoulders and along the belt line of a wearer, said keyboard carrier in combination comprising: bracket means extending from and connected to said brace and plate assembly, spaced apart horizontally extending arms each secured at one end thereof to said bracket means, an upturned finger at an end of each of said arms remote from said bracket means, and a platform removably supported by said arms and secured to said fingers, said platform being adapted for removably mounting a keyboard thereon, each of said arms and said platform having pivotably connecting means located intermediate said bracket means and said finger.

4,450,994
COUPON ORGANIZER
Chester R. Holland, 375 Fairfax Rd., Drexel Hill, Pa. 19026
Filed Jul. 24, 1981, Ser. No. 286,607
Int. Cl.³ B60R *11/00*
U.S. Cl. 224—277 **1 Claim**



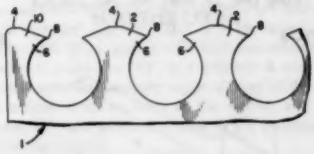
1. For use in combination with a shopping cart having a handle extending alongside a transverse basket member at the upper rear end of the cart basket, a coupon organizer, comprising: a portable molded plastic receptacle having an elongated bottom wall and side walls cooperating therewith to define a horizontally-elongated upwardly-open cavity adapted to contain a series of dividers for segregating shopping coupons therewithin, said receptacle being mounted to said cart with one of its elongated side walls confronting said handle and with its bottom wall engaging on and supported by said transverse basket member, C-type clamping means mounted to said one elongated side wall, said clamping means having a pair of resilient arcuate jaws embracing said handle when mounted thereto, said jaws opening and closing resiliently onto said handle for affording releasable engagement and disengagement of said receptacle with said handle when said receptacle is displaced laterally with respect to said handle, a lid hinged to one of said side walls to provide a closure for said receptacle, and means on said receptacle providing a handle for carrying the same.

4,450,995
SCRIBING MACHINE FOR OPTICAL FIBERS AND METHOD
John J. Leiby, Mt. Penn; Malcolm H. Hodge, Wyncote, and Joseph F. Larkin, Holland, all of Pa., assignors to TRW Inc., Redondo Beach, Calif.
Filed Oct. 28, 1981, Ser. No. 315,634
Int. Cl.³ C03B *37/16*; B26F *3/00*
U.S. Cl. 225—2 **21 Claims**



1. A method for severing an optical fiber projecting from a fiber holder, comprising the step of retaining said fiber holder, clamping the projecting end of the fiber, applying a predetermined first level of tension to said fiber and imparting a flaw to the surface of said tensioned fiber by a scribing device, said predetermined tension being below the level required to propagate a crack through the body of said fiber relieving any torsional stress produce in the fiber by said flaw imparting step, and thereafter, after said scribing device is separated from the fiber, imparting a predetermined second level of tension to said fiber, said second level of tension being above the level needed to propagate a crack through the body of the fiber to provide a mirror surface on the cleaved fiber end and below the level which causes surface imperfections of the cleaved end.

4,450,996
SAFETY BLADE FOR SEVERING STRETCHABLE FILM
Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Mar. 15, 1982, Ser. No. 358,041
Int. Cl.³ B65D *85/671*
U.S. Cl. 225—43 **21 Claims**



9. A dispenser box adapted for receiving a rolled-sheet of material, said box comprising a container compartment having side, end and bottom walls and a cover for the walls, a blade disposed on the dispenser box so that portions of the sheet material can be dispensed from the box and transversely severed across the blade, the improvement comprising said blade having a severing edge comprising a plurality of spaced-apart members, each member extended from the upper edge of the blade and disposed in the plane of the blade, and each member

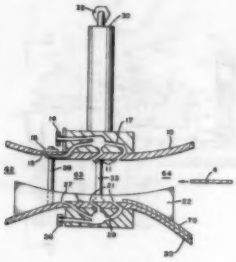
having a blunt upper edge extremity and at least one side-extended tooth with a piercing tip disposed below the blunt upper edge extremity and in the plane of the blade so that the severing edge of the blade can snag sheet material on the side teeth, thereby causing a segment on the material to be severed.

4,450,997

WINDER STRING-UP ASPIRATOR

Hsin L. Li, Parsippany, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 9, 1982, Ser. No. 406,663
Int. Cl.³ B65H *17/32, 51/16*
U.S. Cl. 226—97 **9 Claims**



1. An apparatus for the inline string-up of a rapidly advancing filament from a continuous forming operation onto an inlet winder, comprising:

a. a bottom aspirator plate;

b. a top aspirator plate disposed opposite and in facing relation to said bottom plate and moveable relative thereto;

c. an actuator means for selectively moving said top plate in a direction normal to said bottom plate to adjust the separation therebetween and selectively delimit an aspiration zone between said top and bottom plates, said zone comprising at least one filament inlet portion for receiving said filament, a filament outlet portion for exiting said filament and an aspiration jet portion for capturing, tensioning and directing said filament;

d. a fluid jet means located on inside facing surfaces of said top and bottom aspirator plates and in communication with said aspiration jet portion for providing an aspirating jet of pressurized fluid therein; and

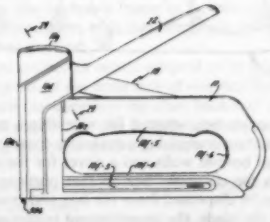
e. a transport means for moving said apparatus to effect filament string-up.

4,450,998

STAPLE-DRIVING TOOLS

Henry Ruskin, 21 Nomahegan Ct., Cranford, N.J. 07016

Filed Dec. 22, 1981, Ser. No. 333,312
Int. Cl.³ B21J *15/38*
U.S. Cl. 227—8 **20 Claims**



1. A tacker including a fixed latch, a staple driver, means for guiding said staple driver along a reciprocating path adjacent said latch between driven and retracted positions, said guiding means accommodating shift of said staple driver out of said reciprocating path when the staple driver is retracted to be restrained by said latch, said tacker including spring means for impelling said staple driver toward said driven position and means providing bias tending to shift said staple driver out of said reciprocating path and into position restrained by said latch, and actuating means for progressively increasing the stored energy in said spring means while said staple driver is restrained by said latch and operative thereafter for shifting said staple driver out of position restrained by said latch and thereby releasing the staple driver for a spring-impelled operation.

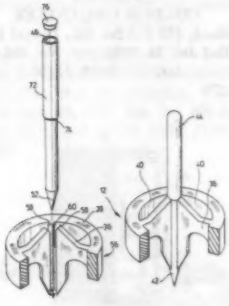
13. A staple-driving tool having a frame, a reciprocable staple driver and actuating means for said staple driver, said actuating means including a manual operating lever, said frame including an elongated unitary first part of sheet metal which comprises first, second and third portions arranged as a U-shape providing a hand hole, said portions being largely of U-shaped cross-section having webs along the perimeter of the hand hole, said manual operating lever being assembled to said frame opposite to said first portion for enabling said lever and said first portion to be manually squeezed toward each other, said frame including a second part of sheet metal joined to extremities of said first and third portions of the first part and forming a fourth portion of the hand hole completing the perimeter thereof, said second part forming a guide for said staple driver.

4,450,999

INJECTION MOLDING HOT TIP SEAL

Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

Filed Jul. 19, 1982, Ser. No. 399,787
Claims priority, application Canada, Jul. 12, 1982, 407096
Int. Cl.³ B29F *1/04*
U.S. Cl. 228—176 **1 Claim**



1. A method of manufacturing an integral injection molding nozzle seal having a body portion and a central pin portion, the body portion having a generally cylindrical outer portion and a plurality of spaced ribs which extend radially inward from the outer portion to join the pin portion which extends centrally through the outer portion in alignment therewith, the central pin portion having a tip portion extending in one direction and a head portion extending in the opposite direction, the central pin portion being formed of a highly conductive inner portion and an abrasion and corrosion resistant outer portion, comprising the steps of:

(a) forming the body portion having the outer portion with the plurality of ribs extending radially inward therefrom, the ribs having inward ends which define a central channel therebetween,

(b) forming a hollow elongated pin casing out of an abrasion and corrosion resistant material, the pin casing having a closed lower tip and an open upper mouth,

(c) inserting a predetermined quantity of highly conductive material into the hollow pin casing through the open mouth,

(d) heating the pin casing in an upright position in a vacuum furnace until the highly conductive material melts and runs downward to integrally fill a lower portion of the casing leaving an empty upper portion of the casing,

(e) cutting off an upper portion of the casing to form an integral filled casing portion of a predetermined length,

(f) locating the filled casing portion in a predetermined position in the central channel between the ribs, and locating a cap formed of an abrasion and corrosion resistant material on the filled casing portion, and

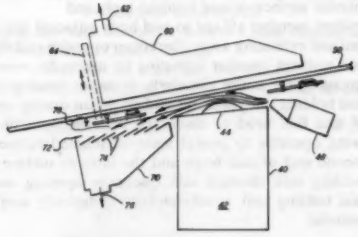
(g) joining the cap to the filled casing portion to form the central pin portion, and the central pin portion to the outer portion to form the integral nozzle seal by applying a brazing material to the joints between them and brazing in a vacuum furnace.

4,451,000

SOLDERING APPARATUS EXHAUST SYSTEM

David E. Stephens, Concord, Mass., assignor to Hollis Engineering, Inc., Nashua, N.H.

Filed Jun. 11, 1982, Ser. No. 387,462
Int. Cl.[3] H05K 3/34
U.S. Cl. 228—20 10 Claims



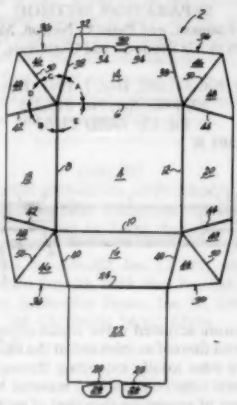
1. In apparatus for mass joining with solder electrical and electronic components assembled in a circuit board and comprising in combination: a mass soldering station adapted to deposit a quantity of molten solder onto said board underside whereby to join said board and said components; an excess solder removal station adjacent and downstream of said soldering station, said excess solder removal station comprising at least one gas jet disposed below the travel path of said board and adapted to direct a fluid gas stream onto the freshly deposited solder on said board underside, a source of pressurized fluid, and means connecting said source and said at least one fluid jet; said excess solder removal station being adapted to relocate or remove a portion of the molten solder deposited on said board before said molten solder solidifies; and means for transporting said circuit board in line-through said mass soldering station, and said excess solder removal station; the improvement which comprises a louvered exhaust system adjacent and upstream of said soldering station, said louvered exhaust system having a generally horizontal louvered surface located below the path of said circuit board, the louvers of which extend and open into the path of said gas stream, and including exhaust means for removing gases from the underside of said louvered surface.

4,451,001

WRAP AROUND SLEEVE FOR TAPERED TUB

George P. Webinger, Robbinsdale, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 28, 1982, Ser. No. 402,775
Int. Cl.[3] B65D 5/06
U.S. Cl. 229—40 2 Claims



1. A sleeve for encasing an article having a tapered side wall, said sleeve being formed from sheetstock material and comprising:

(a) a top wall having side edges;

(b) a pair of first side walls, one of each being foldably connected to opposite first side edges of said top wall, said first side walls tapering downwardly and inwardly from said first side edges of said top wall;

(c) a pair of second side walls, one of each being foldably connected to opposite second side edges of said top wall, said second side walls being substantially perpendicular to said top wall;

(d) a plurality of corner panels, one of each foldably interconnecting adjacent side edges of said first and second side walls, each of said corner panels being divided into a pair of associated tuck panels by a fold line, wherein C is an included angle between said fold line and a first fold connection between each of said corner panels and said first side walls; D is an included angle between said fold line and a second fold connection between each of said corner panels and said second side walls; A is an included angle between said first fold connection and a third fold connection between said first side walls and said top wall; B is an included angle between said second fold connection and a fourth fold connection between said second side walls and said top wall; and E is an included angle between said third and fourth fold connections; wherein $A+B+C+D+E=360°$; and wherein A and B are equal and are equal to the acute angle of taper of the side wall of the article to be encased in the sleeve; and wherein E equals 90°; and wherein C and D are determined by the following formuli:

$$C + D = 360° - (A + B + E)$$

$$\frac{90° - (A \text{ or } B)}{2} + \frac{C + D}{2} = D$$

$$(C + D) - D = C$$

said corner panels being folded along said fold line to position one of the tuck panels in each pair thereof in face-to-face contact with one of said first side walls

whereby the perpendicularity of said second side walls is maintained; and

(e) a bottom wall interconnecting bottom edges of said first side walls.

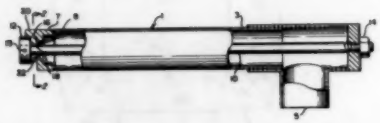
4,451,002
TEMPERATURE ACTUATED VALVE AND PHASE SEPARATION METHOD

David J. Klee, Emmaus, and Peter C. Nelson, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 328,052, Dec. 7, 1981. This application Jul. 19, 1983, Ser. No. 515,315

Int. Cl.³ G05D *23/02*

U.S. Cl. 236—101 R **11 Claims**



1. A temperature actuated valve which comprises a housing having at one end thereof an inlet and at the other end an outlet orifice, a valve stem axially extending through the length of said housing, said stem comprising a material having a greater linear coefficient of expansion than that of said housing and at least a portion having a cross-sectional area less than that of said outlet orifice, and a valve seat mounted on said portion of said valve stem outside of and adjacent to said outlet orifice and seated in sealing engagement with said orifice when said valve is at its substantially lowest operable temperature.

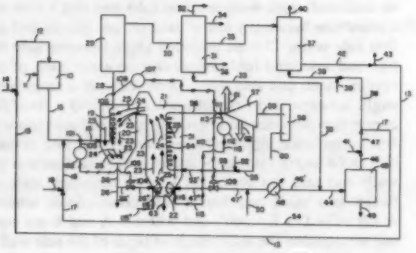
4,451,003
CONTROL SCHEME AND APPARATUS FOR A COGENERATION BOILER

Henry F. de Mena, Florham Park, and Michael A. Tanoff, Highland Park, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 9, 1983, Ser. No. 502,816

Int. Cl.³ F23H *1/08*

U.S. Cl. 236—14 **6 Claims**



1. An improved control system for maintaining the outlet temperature of a process fluid exiting from a heat exchange coil within a desired temperature range in a boiler having a radiant section and a convection section comprising means for measuring the inlet temperature and the flow rate of the process fluid adjacent the inlet to said heat exchange coil, first means responsive to changes in said inlet temperature and flow rate to vary the amount of flue gas recirculated from said convection section to said radiant section, means for measuring the temperature of the process fluid adjacent the outlet of said heat exchange coil, a second means responsive to changes in outlet temperature of said process fluid to vary the amount of fuel fed to said radiant section for combustion therein, whereby said first means and said second means, respectively, provide simultaneous feedforward and feedback control in said boiler to maintain the desired process fluid outlet temperature within close tolerances during large upset changes in process fluid inlet temperature or flow rate.

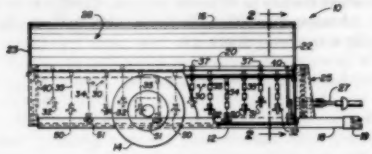
4,451,004
FLAIL HEAD

William F. Ostergren, Terre Hill, and Albert J. Ipnar, East Earl, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 23, 1979, Ser. No. 32,203

Int. Cl.³ A01C *3/06*

U.S. Cl. 239—658 **13 Claims**



1. A flail head to be affixed to the flexible link of a flail spreader, said flail spreader having a generally cylindrical holding tank with a discharge opening therein and an at least partially circular cross sectional configuration normal to said discharge opening, said flail head being operable to discharge material from within said holding tank through said discharge opening, said flail head comprising:

a rigid body having a first end and an opposing second end, said first end including means for connecting said body to the flexible link, said second end being spaced from the interior surface of said holding tank; and

a resilient member affixed to said body adjacent said second end and extending away therefrom opposite said first end, said resilient member including tip means for sweepingly engaging the entire circularly cross sectional portion of said holding tank adjacent said tip means during operation of said flail head to discharge material, said tip means being operable to propel material situated between said second end of said body and the interior surface of said holding tank through said discharge opening such that said holding tank is substantially completely emptied of material.

4,451,005
GAS FLOW TYPE CRUSHING AND CLASSIFYING APPARATUS

Kiyoshi Urayama, Yahata, Japan, assignor to Kabushiki Kaisha Hosakawa Funtai Kogaku Kenkyosho, Osaka, Japan

Continuation of Ser. No. 320,375, Nov. 12, 1981, abandoned. This application Oct. 21, 1983, Ser. No. 545,101

Claims priority, application Japan, Nov. 13, 1980, 55-160497; Feb. 14, 1981, 56-20457; May 20, 1981, 56-77238

Int. Cl.³ B02C *19/06*

U.S. Cl. 241—40 **7 Claims**

1. A gas flow type crushing and classifying apparatus comprising

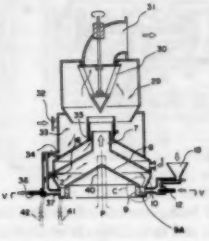
a first circulation classifying chamber including a first coarse particle discharge duct connected to a peripheral portion thereof and a first fine particle discharge duct connected to the chamber about an axis of circulation,

baffle means disposed in said first circulation classifying chamber to be peripherally impinged upon by materials under treatment which are jetted out on high velocity gas flows from at least one nozzle such that said materials rebounding from said baffle means have components of velocity in a circulating direction within said first circulation classifying chamber,

a second circulation classifying chamber connected directly to the top of said first circulation classifying chamber to be substantially coaxial therewith and substantially concentric with said first fine particle discharge duct,

said circulation chamber including a second fine particle discharge duct substantially coaxial with said first fine particle discharge duct,

a vane wheel mounted in said second circulation classifying



chamber, spaces between adjacent pairs of vanes being in communication with said second fine particle discharge duct, and

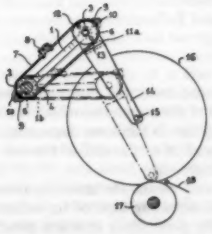
a gas classifying chamber interposed between said first and second circulation classifying chambers for blowing upwardly fine particles of the materials descending from said second circulation classifying chamber, said gas classifying chamber including a second coarse particle discharge duct connected to a peripheral portion thereof.

4,451,006

PACKAGE-LIFTING SYSTEM IN AN UNWINDING OR TWISTING MACHINE

Guy Decuq, and Anne Mouterde, both of Lyons, France, assignors to Verdol S.A., Caluire, France

Filed Apr. 6, 1983, Ser. No. 482,697
Claims priority, application France, Apr. 7, 1982, 82 06538
Int. Cl.³ B65H *54/42*
U.S. Cl. 242—18 DD **7 Claims**



1. In a yarn package winding machine of the type including package-lifting means supporting a package core being wound against a drive drum adjacent to a yarn traverse, an improved package-lifting means comprising:

(a) a spindle disposed parallel to the axis of the drive drum for supporting a package core;

(b) a first shaft fixed to the machine and disposed parallel to the spindle;

(c) a first wheel non-rotatably mounted on the first shaft;

(d) an arm member pivotally supported on the first shaft and having bearing means located on the arm member spaced from the first shaft;

(e) a second shaft supported in said bearing means parallel to the spindle;

(f) a second wheel supported on the second shaft and rotatable with respect to the arm member;

(g) a funicular member extending around both wheels and tensioned therebetween, the funicular member being fixed to a point on the periphery of each wheel; and

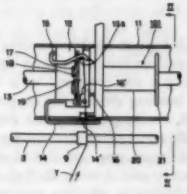
(h) a stirrup having arms extending toward and supporting said spindle, and the stirrup being mounted to rotate with said second wheel, whereby as the package grows in diameter during winding of yarn thereon the stirrup and arm member will pivot away from the drive drum about the first shaft and the funicular member will wind on one side of the first wheel and unwind from one side of the second wheel thereby to decrease the angle between the arm member and the arms of the stirrup.

4,451,007

YARN WINDING APPARATUS

Tadahiko Ohkubo; Tetsuhiko Endo, and Akiwo Andoh, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 339,003, Jan. 12, 1982, abandoned. This application Sep. 23, 1983, Ser. No. 534,404
Claims priority, application Japan, Jan. 16, 1981, 56-3730
Int. Cl.³ B65H *54/02, 67/04*
U.S. Cl. 242—18 R **23 Claims**



1. An apparatus for winding continuously supplied yarn at a substantially constant speed, comprising:

(a) a rotating drum having a winding part rotatable at a predetermined peripheral speed for winding the yarn around a peripheral surface thereof, a transferring part for successively transferring the yarn wound around said winding part, and a storage part for storing the yarn fed by said transferring part, said winding, transferring and storage parts being disposed adjacent to one another in the order named;

(b) a toothed wheel to catch the continuously supplied yarn around said rotating drum;

(c) a yarn guide for guiding the continuously supplied yarn onto said winding part of said rotating drum,

(i) said toothed wheel being mounted coaxially with said rotating drum on an end of the latter which is remote from said storage part of said rotating drum; and

(ii) said yarn guide being positioned upstream of said rotating drum with respect to the direction of supply of the yarn; and

(d) a yarn take-up assembly disposed with respect to said toothed wheel and including:

(i) a bobbin supporting mechanism for rotatably supporting a bobbin;

(ii) a bobbin driving mechanism for driving the bobbin; and

(iii) a yarn traversing mechanism for traversing the yarn axially of the bobbin to wind the yarn around the bobbin and form yarn layers thereon,

said bobbin driving mechanism having an axis of rotation of the bobbin which extends substantially parallel to the axis of rotation of said rotating drum; and

said yarn guide being movable across a zone in which the yarn is being traversed by said yarn traversing mechanism.

4,451,008

DOUBLE WIRE-WINDING MACHINE WITH AUTOMATIC TRANSFER

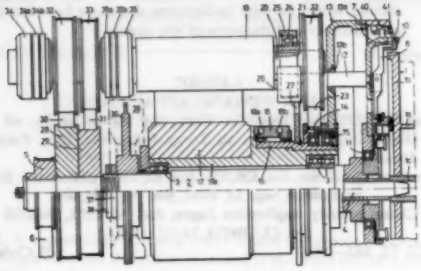
Louis Veyrassat, Rolle, and Marc Meisser, Meyrin, both of Switzerland, assignors to Maillefer S.A., Ecublens, Switzerland

Filed May 17, 1982, Ser. No. 378,602

Claims priority, application Switzerland, Jun. 3, 1981, 3637/81

Int. Cl.³ B65H *54/02, 67/04*

U.S. Cl. 242—25 A **6 Claims**



1. A machine for use in double-winding having an automatic transfer device and including at least one reel driving shaft, means for driving a reel coupled to a forward end of said driving shaft, a bearing device for supporting said shaft near said forward end, a wire snagging disk disposed coaxially with said driving shaft and means for driving said disk with said driving shaft and for causing said disk to effect a lagging movement with respect to said driving shaft during a predetermined period of time during a winding operation, said means for driving said disk comprising an auxilliary shaft parallel to said driving shaft, first transmission means between said driving shaft and said auxilliary shaft, and second transmission means between said auxilliary shaft and said snagging disk, wherein the improvement in said means for driving said disk comprises:

said means for driving said disk exclusively comprising said first and second transmission means wherein said first transmission means includes two separate transmission gears with slightly different transmission ratios, each of said transmission gears being coupled between said driving shaft and said auxilliary shaft and each having a gear part secured to said driving shaft, said first transmission means further including two disengageable coupling devices each coupled between said auxilliary shaft and a different one of said transmission gears to selectively couple one of said transmission gears to drive said auxilliary shaft, said gear parts of both said transmission gears which are secured to said driving shaft being located behind said bearing device with respect to said forward end.

4,451,009

WINDING MECHANISM

John B. Mann, 41 Main St., Calverton, Nottingham, England

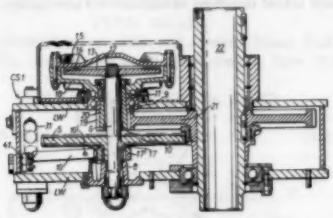
Filed Dec. 31, 1981, Ser. No. 336,480

Claims priority, application United Kingdom, Jan. 3, 1981, 8100048

Int. Cl.³ B65H *77/00, 79/00*

U.S. Cl. 242—54 R **36 Claims**

1. A winding mechanism for winding up a cable comprising means for taking on and paying off the cable, said means having a winding member on which the cable is wound up and from which the cable can be wound off, and one-way drive means for applying torque to the winding member to rotate the latter to wind up the cable; said drive means comprising (A) a slippable friction clutch having an input member and an output member one of which members is axially displaceable relative to the other member (B) a gear wheel arrangement comprising a driving gear wheel and, meshing therewith, a driven gear wheel; one of said gear wheels being axially displaceable in relation to the other of the gear wheels while still permitting torque to be transmitted by the gear wheels, and the displaceable gear wheel being connected to the displaceable clutch member to rotate and to undergo axial displacement therewith; and (G) means for effecting axial displacement of the displaceable clutch member relative to the other clutch member in order to maintain a driving connection between the clutch input and output members.



4,451,010

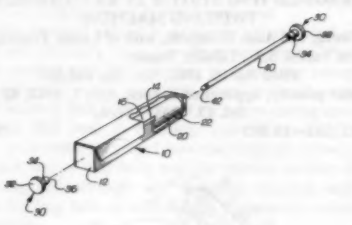
REUSABLE ROD ASSEMBLY FOR MOUNTING BOXED ROLLS OF MATERIAL

Marcus F. Meyer, 954 "I" St., Washougal, Wash. 98671

Filed Nov. 2, 1981, Ser. No. 317,203

Int. Cl.³ B65F *3/02;* **B65H** *35/06*

U.S. Cl. 242—55.53 **7 Claims**



1. A portable rod assembly for providing supplemental mounting of a roll of sheet material which is already housed in a storage box, in order to facilitate dispensing the sheet material without the need of or the risk of the roll being removed from the box, comprising:

small diameter rod means for inserting through the roll of sheet material including tapered tip means on at least one end for initially perforating opposite panels at the ends of the box containing the roll of material;

a pair of bearing members each having central bearing means of substantially constant diameter which is more than the diameter of said rod means and less than the diameter of the roll of material and further including tapered bevel means on the forward end which are manually insertable through opposite panels at the end of the box, respectively, into the roll for making enlarged perforations to receive said bearing members, with adjacent portions of said central bearing means capable of loosely journaling the roll of material during its rotation to retain the roll inside the box while also holding the roll in a suspended position off the bottom of the box and snugly engaging the edges of the box perforations formed by said tapered bevel means;

cap members having a diameter greater than the diameter of

said central bearing means and carried on the outer ends of said bearing members, respectively;

said rod means extending between said pair of bearing members for holding said bearing members together in mounted position in the aforesaid box panels with said cap members a predetermined distance apart outside the aforesaid box panels; and

attachment means removably connecting at least one of said bearing members to said rod means for coupling the rod assembly together into an integral unit with the box during use and to enable the rod assembly to be disengaged after use from a box having an empty roll of material and reinserted into another box having a full roll of material.

4,451,011

FILM WINDING SPOOL FOR PHOTOGRAPHIC CAMERA

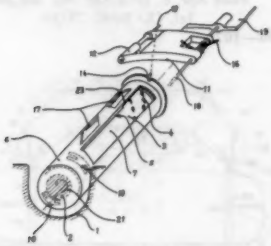
Dieter Engelsmann, Unterhaching; Leo Lippl, Munich; Reinhard Nicko; Peter Stiefel, both of Munich, and Peter Lermann, Naring, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,825

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120268

Int. Cl.³ G03B *1/04*; B65H *75/28*

U.S. Cl. 242—71 **8 Claims**



1. A film winding spool for a photographic camera, comprising an inner substantially cylindrical member which is driven in rotation; means on said inner member engaging an initial portion of a film; and an outer substantially cylindrical member substantially completely surrounding said inner member so as to form a space therebetween and having an outer surface for winding successive coils of the film; means for allowing introduction of the initial portion of a film into said space and including a slot provided at a predetermined location of said outer surface of said outer member and having a predetermined dimension; and means for allowing withdrawal of pieces of the film, separated from a remaining part of the film from said space between said inner and outer members, said withdrawal means including a plurality of openings unsuitable for initial-film-portion introduction, each arranged at a location spaced from the location of said slot and having a dimension smaller than the dimension of the latter, each of said openings extending in a longitudinal direction and in a circumferential direction of said outer member, and said openings being distributed over said outer surface of said outer member.

4,451,012

FISHING LINE CONTROL DEVICE

John W. Puryear, and Arthur D. Callan, both of Tulsa, Okla., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 112,917, Jan. 17, 1980, Pat. No. 4,362,763. This application Feb. 4, 1982, Ser. No. 345,876

Int. Cl.³ A01K *89/01*

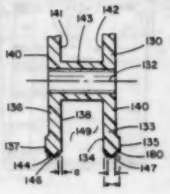
U.S. Cl. 242—84.2 A **10 Claims**

1. A fishing reel spool comprising:

(1) a center section having first and second end faces and a middle portion, a passageway through the middle portion and being concentric therewith, the passageway opening at the first and second faces;

(2) a first cylindrical flange at the first face and extending radially outwardly from the middle portion, the flange having inner and outer surfaces, the flange having a preselected thickness in a direction parallel to the passageway through the spool;

(3) a first rim at the periphery of the first flange projecting



radially outwardly and having a thickness less than the thickness of the flange;

(4) an adhesive coating covering the rim; and

(5) a plurality of substantially short resilient fibers projecting substantially perpendicularly outwardly from the rim and secured thereto by the adhesive, said rim thickness being less than the thickness of the flange so that fibers lying substantially parallel to the passageway will not extend beyond the inner surface of the first flange.

4,451,013

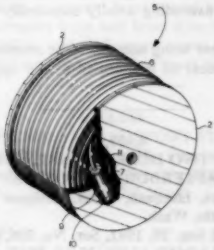
TELEPHONE CABLE REEL

Elliot P. Bedrosian, Sterling, Va., assignor to Siecor Corporation, Hickory, N.C.

Filed Oct. 18, 1982, Ser. No. 434,836

Int. Cl.³ B65H *75/14*

U.S. Cl. 242—118.4 **5 Claims**



1. A cable reel comprising:

(a) first and second spaced apart upstanding flanges;

(b) a cylindrical shaped cross member, a terminal portion of one end of said cross member attached to said first flange and the terminal portion of the other end attached to the second flange;

(c) a disc shaped support means disposed inside of said cross member and spaced apart from said first flange;

(d) a cable terminal receiving means comprising a container adapted to receive a pre-connectorized terminal portion of a cable, said container having at least one opening therein, said opening facing the cylindrical shaped cross member; and,

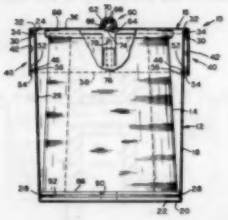
(e) an aperture in said cylindrically shaped cross member aligned with the opening in said container, the size of said aperture being at least as large as the opening of said container.

4,451,014

WIRE STORING AND DEREELING APPARATUS

Robert A. Kitt, Albion, and Harold L. Wirts, Garrett, both of Ind., assignors to Mossberg Industries, Inc., Garrett, Ind.

Filed Aug. 11, 1982, Ser. No. 407,146
Int. Cl.³ B65H *49/00*
U.S. Cl. 242—128 **11 Claims**



4. Apparatus for storing and dereeling wire on a spool disposed with the axis thereof upright, comprising:

a container having an open top and a bottom having an arbor receiving recess therein, the container adapted to receive said spool therein,

a cover being receivable over said open top of said container, said cover being movable on said container between a closed position and a dereeling position wherein a midportion of said cover is spaced above said spool a predetermined distance,

locking means on one of said container and said cover,

means on the other of said container and said cover for engaging said locking means to removably secure said cover in said dereeling position,

means centrally disposed of said container axially above said spool for receiving a strand of wire being unreeled from said spool, and

a boss member disposed on the outer surface of said cover midportion in axial alignment with said recess in said bottom and extending axially outwardly from the outer surface,

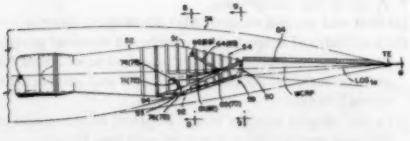
said boss member being adapted to be received in the arbor-receiving recess of a spool in a like apparatus stacked thereon.

4,451,015

JET ENGINE TWO DIMENSIONAL, ASYMMETRIC AFTERBURNER NOZZLE

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,746
Int. Cl.³ B64D *33/04, 27/18*; F02K *1/00*
U.S. Cl. 244—15 **20 Claims**



1. In a jet propulsion engine of the type adapted to be mounted on an airfoil's wing spar structure and having either a convergent or a CD jet nozzle defining a minimal included angle θ between the wing chord reference plane and the trailing edge line-of-sight into the nozzle, a nozzle assembly comprising, in combination:

(a) a fixed stationary upper nozzle duct fixedly mounted on the engine mounted on the airfoil's wing spar structure and defining a stationary upper nozzle wall and a first pair of stationary spaced depending nozzle sidewalls;

(b) a translatable lower swing tray defining a bottom nozzle floor and a second pair of spaced upstanding nozzle sidewalls, said first and second pairs of nozzle sidewalls being mounted in overlapping relation with respect to one another with freedom for relative movement therebetween;

(c) mounting means for pivotally coupling said translatable lower swing tray to said fixed stationary upper duct with freedom for controlled fore and aft pendular rocking movement with respect thereto;

(d) sealing means mounted on the foreward end of said swing tray and interposed between said swing tray and the lower aft end of the engine and defining a wiping seal therebetween at all fore and aft positions of said swing tray; and,

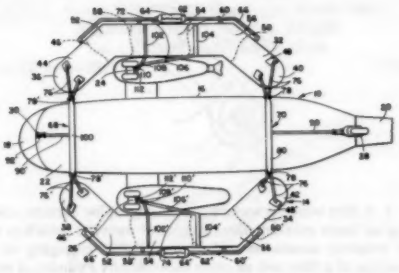
(e) actuating means for rocking said swing tray in a fore and aft direction relative to the engine between a first convergent cruise nozzle position defining a minimal nozzle opening and a second convergent afterburner nozzle position defining a maximum nozzle opening.

4,451,016

AUXILIARY FLOTATION SYSTEM

David F. Genovese, Peninsula, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,504
Int. Cl.³ B64C *25/56*
U.S. Cl. 244—107 **5 Claims**



1. An auxiliary flotation system for aircraft downed at sea comprising a first inflatable collar for positioning on the left side of the aircraft, a second inflatable collar for positioning on the right side of the aircraft, supporting means for connecting said first inflatable collar and said second inflatable collar to the aircraft, said supporting means including strap means extending directly between one end of said first inflatable collar and a corresponding end of said second inflatable collar, positioning means fastened to said strap means and having means for connection to, and beneath, a first end portion of the aircraft for holding said strap means in a position for supporting a predetermined part of the aircraft upon inflation of said first inflatable collar and said second inflatable collar, and means for inflating said first inflatable collar and said second inflatable collar after said positioning means is attached to the aircraft, said supporting means further including a second strap means extending between the other end of said first inflatable collar and a corresponding end of said second inflatable collar, a second positioning means fastened to said second strap means and having means for connecting said positioning means to, and beneath, a second end portion of the aircraft for locating said second strap means in a position for supporting a second predetermined part of the aircraft upon inflation of said first inflatable collar and said second inflatable collar, said supporting means also including a third and fourth strap means connected to said first inflatable collar and said second inflatable

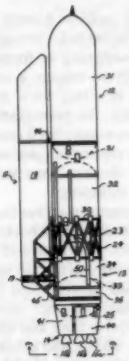
collar, respectively, at positions intermediate the ends of said first inflatable collar and said second inflatable collar for supporting an intermediate part of the aircraft, said third and four strap means being attached to, and beneath, the aircraft at a position intermediate said position for supporting a first predetermined part of the aircraft and said position for supporting a second predetermined part of the aircraft.

4,451,017

THREE STAGE ROCKET VEHICLE WITH PARALLEL STAGING

William R. Marshall, Madison, Ala., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 431,886
Int. Cl.³ B64G 1/40
U.S. Cl. 244—172 **5 Claims**



1. A three-stage rocket launch vehicle having a propellant feed system from a forward tank stage to an aft tank stage, comprising:

axially aligned forward and aft tanks for carrying propellants for rocket engines;

an intertank structure fixedly joined to the front portion of said aft tank and severably joined to the rear portion of said forward tank;

an engine mount structure secured to the rear portion of said aft propellant tank;

at least one rocket engine supported by said engine mount structure;

a pair of solid rocket boosters secured to opposed sides of said forward and aft propellant tanks;

said forward propellant tank having a front pressure vessel for carrying hydrogen and a rear pressure vessel for carrying oxygen;

said aft tank having a front pressure vessel for carrying hydrogen and a rear pressure vessel for carrying oxygen;

a first pipe line communicating said front pressure vessels, and a second pipe line communicating said rear pressure vessels for feeding propellants from the front pressure vessels to said rear pressure vessels as propellant is provided from said rear pressure vessels to said at least one rocket engine;

each said first and second pipe lines having on-command shut-off valves and joint means for severing the pipe line on-command;

third and fourth pipe lines communicating, respectively, said forward vessel and said rear vessel of said aft propellant tank with said at least one rocket engine supported by said engine support structure; and

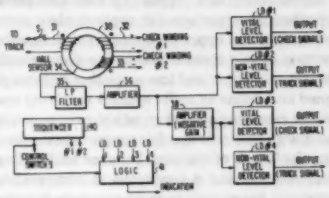
an elongated payload structure severably fixed to the third side of said forward propellant tank and fixed to the third side of said aft propellant tank, said payload structure extending parallel to said forward and said aft propellant tanks.

4,451,018

NON CONTACT ISOLATED CURRENT DETECTOR

Barry L. Smith, and William A. Petit, both of Rochester, N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 10, 1982, Ser. No. 356,080
Int. Cl.³ B61L 25/00, 21/00
U.S. Cl. 246—122 R **7 Claims**



1. A DC track circuit sensitive to current variations comprising:

a quasi-DC pulse source of current coupled to a pair of track rails,

a current sensitive receiver coupled to said pair of track rails, said current sensitive receiver comprising:

a toroidal core with an air gap, said core coupled to said track rails via a single conductor,

a Hall sensor located in said air gap to sense a magnetic field induced in said core by current coupled from said track rails,

operational amplifier means for amplifying a signal emitted by said Hall sensor, and

level detector means coupled to said operational amplifier means to emit a distinctive signal in the event that an input to said level detector means exceeds a threshold established at said level detector means,

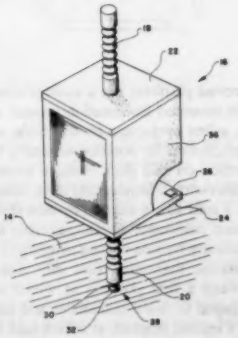
whereby changes in current level in said track rail produce distinctive outputs from said level detector means as said signal emitted by said Hall sensor varies above and below the threshold established by said level detector means.

4,451,019

POLE TYPE SPEAKER SUPPORT STRUCTURE

James B. Bensel, 2005 Brucemount Pl., Fayetteville, N.C. 28304

Filed Dec. 21, 1981, Ser. No. 332,537
Int. Cl.³ A47G 29/00
U.S. Cl. 248—1 **6 Claims**



1. A compressive pole type audio speaker support structure for adjustably supporting various size audio speakers interme-

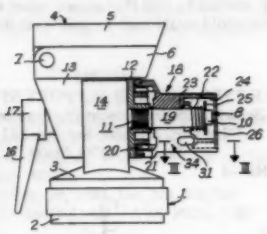
diately between a floor and ceiling structure, comprising: speaker support means including an elongated lower pole support structure normally extending upright between the floor and the speaker to be supported and including upper and lower ends, and an elongated upper pole support structure normally extending between said ceiling and a top portion of said speaker and including upper and lower ends, and wherein said upper and lower pole support structures are aligned; a lower speaker support plate means fixed to the upper end of said lower pole support structure of said speaker support means for receiving and supporting a bottom portion of said audio speaker; an upper speaker support plate means fixed to the lower end of said upper pole support structure for engaging a top portion of said speaker and acting downwardly thereon, and wherein said upper and lower speaker support plate means are aligned and define an audio speaker receiving spaced therebetween for receiving a speaker; adjustment means operatively associated with said pole speaker support means for effectively adjusting the length of the same between said ceiling and floor such that said speaker is supported in compression between said upper and lower pole support structure forming a part of said speaker support means and wherein said lower and upper speaker support plate means including a pair of opposed flat speaker engaging surfaces of a substantial area for engaging said speaker and bearing thereagainst so as to hold and retain said speaker by compression thereby obviating the need for a screw or bolt type interconnection between the plate means and the speaker.

4,451,020

PLATFORM FOR A CAMERA OR CINE CAMERA STAND

Patrick Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed Aug. 5, 1981, Ser. No. 290,395
Claims priority, application France, Aug. 19, 1980, 8018140
Int. Cl.³ F16M *11/12*
U.S. Cl. 248—183 **2 Claims**



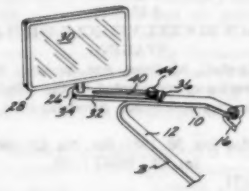
1. An improved platform for a camera comprising a turret having a table mounted for rotation around a vertical axis, a deck element, a first projection on said table, a shaft supported on said first projection for rotation around a horizontal axis, a second projection on said deck element secured to said shaft for rotation therewith, whereby said deck element is supported on said table, a split sleeve carried by said shaft for rotary and axial movement, respective interengageable toothed elements carried respectively by said second projection and by said split sleeve for rotation therewith, said split sleeve being axially movable between a first position at which said toothed elements are engaged to cause said sleeve and said shaft to rotate as a unit and a second position at which said toothed elements are out of engagement to permit said sleeve to rotate on said shaft, resilient means urging said sleeve to said first position, a control handle and means for screwing said handle onto said sleeve to clamp said sleeve to said shaft.

4,451,021

REAR VIEW MIRROR EXTENSION ASSEMBLY

Charles E. Merriss, 10838 S. Cullman Ave., Whittier, Calif. 90603

Filed Mar. 8, 1982, Ser. No. 356,025
Int. Cl.³ B60R *1/06*
U.S. Cl. 248—480 **3 Claims**



1. In an automotive vehicle having a bracket extending outwardly therefrom that includes an upper horizontal portion in which a transverse opening is formed through which a screw extends upwardly to engage a tapped bore extending downwardly in a post of a rear view mirror to support said mirror from said bracket, the combination with said bracket after said mirror and screw have been removed therefrom of an assembly for adjustably supporting said mirror outwardly from said vehicle a greater distance than when mounted on said bracket, said assembly including:

a. an elongate rigid adaptor member that has first and second ends, and resting on said upper horizontal portion, a transverse bore adjacent said first end through which said screw extends upwardly to engage said tapped bore in said post to support said mirror from said member, and an elongate slot in said member intermediately disposed between said transverse bore and said second end;

b. a bolt that includes a head, and a shank that extends downwardly therefrom through said slot to have a portion of said shank situated there-below, said portion having external threads thereon;

c. a nut that engages said threads; and

d. a plurality of washers that have said shank extending therethrough and that are in contact with said elongate rigid member and said bracket, with said slot permitting said rigid member and mirror to be moved longitudinally relative to said bracket to improve the field of vision visible in the mirror relative to that obtainable when the mirror is mounted on said bracket, and said elongate member and mirror being maintained in the position to which they are adjusted by tightening said nut to compress said washers and force them into frictional engagement with said head and nut and said bracket and elongate member.

4,451,022

READY PAD FOR CONCRETE

Lawrence M. Sauger, 2146 Parliament, Sterling Heights, Mich. 48077

Filed Apr. 7, 1982, Ser. No. 366,365
Int. Cl.³ B28B *7/04*
U.S. Cl. 249—2 **2 Claims**

1. A reusable form for a formed in place concrete pad comprising:

two spaced side beams of a predetermined length having first and second ends, each of said side beams comprising a flat first side portion, and flat top and bottom portions extending perpendicularly from said first side portion;

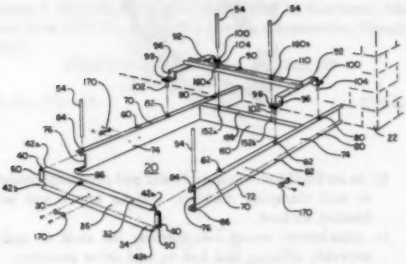
a front beam engaging said side beams at said second ends including a flat second side portion and flat top and bottom portions extending perpendicularly from said second side portion;

connecting means for connecting said front beam to said side beams proximate said second ends and for aligning the respective top portions of said side beams and said front

beam in co-planar relation;

transverse stabilizer means mounted to and suspended above said side beams for establishing a parallel spacing between said side beams and for squaring and establishing a perpendicular relation between said side beams and said front beam including a transverse beam having at least two apertures therethrough;

mounting means for securing said transverse beam to each of said side beams in a spaced apart relation from the respective said tops of each of said side beams, wherein said mounting means comprises: an upraised central portion, adapted to engage said transverse beam, a pair of lower flange members extending down and outwardly from said central portion, a pair of mounting pins, one each extending downward for a respective one of said lower flange members; and wherein each of said side beams includes second and third alignment holes adapted to receive said respective pair of said mounting pins;



an end beam mounted below said transverse stabilizer means having first and second ends for engaging one of each of said side beams in abutting, level relation and apertures, equal in number to the apertures in said transverse beam and aligned therewith, said apertures in said end beam extending therethrough; and

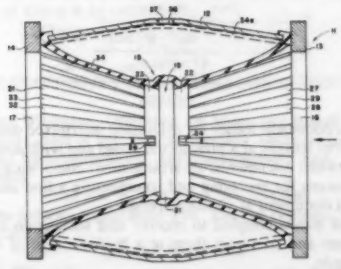
a pin received through each of said apertures of said transverse beam and extending through the corresponding apertures of said end beam for securing said end beam to said transverse beam.

4,451,023

TUBE-DIAPHRAGM VALVE

Avi Zakai, Rishon Le-Zion, Israel, assignor to Mil Mutzarim (1971) Techniim B.M., Holon, Israel

Filed Sep. 8, 1981, Ser. No. 300,125
Int. Cl.³ F16K 7/07
U.S. Cl. 251—5 **10 Claims**



1. A tube valve for controlling hydraulic flow therethrough, said valve comprising:

valve casing means,

first and second port means spaced apart in said casing means along a longitudinal axis, definable as a first axis,

a hollow support structure having pervious walls extending between said port means,

an impervious stationary barrier transversing said structure along said first axis and positioned to cause hydraulic fluid to flow through said pervious walls and around said barrier,

resilient tube means surrounding said structure and extending substantially from port to port,

said tube means having a valve closed position when abutting said barrier thereby preventing flow around said barrier and a valve opened position remote from said barrier thereby enabling flow around said barrier,

said casing and said tube means defining a control chamber,

aperture means in said casing to enable varying the pressure in said control chamber to move said tube means between said valve closed position and said valve opened position, and

said barrier comprising a central member against which said tube means abuts when said valve is in said closed position, and at least a first side member in contact with said central member and being disposed on the side of the port, serving as the outlet port, the dimension of said central member being greater than the dimension of said first side member in a direction transverse to said first axis, whereby as said tube means moves toward said valve closed position the differences between the dimensions of said central member and side member of said barrier transverse to said first axis results in the production of a pressure adjacent the central member on the side of the outlet port which dampens the hammer effect by reducing the rate at which said tube means comes in contact with said central member,

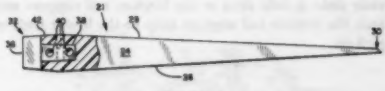
said first side member being shaped as a truncated cone with the truncated top in contact with said central member with the dimension of the base of said truncated cone in a direction transverse to said first axis being less than the dimension of said central member, whereby the pressure and the space between the exposed side of said central member and the exposed side of said truncated cone and the tube means when the latter moves toward said central member to be in the valve closed position is greater than the pressure in the portion of said hollow support structure between said barrier and the port serving as the outlet port and is less than the pressure in the structure portion between said barrier and the port serving as the inlet port.

4,451,024

FELLING WEDGE

Larry M. Shepherd, P.O. Box 332, Grants Pass, Oreg. 97526

Filed Jan. 13, 1983, Ser. No. 436,184
Int. Cl.³ B26F 3/18
U.S. Cl. 254—104 **7 Claims**

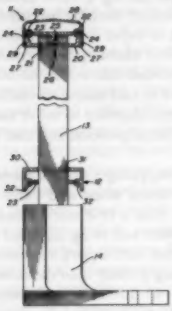


1. A felling wedge for use in conjunction with a cutting saw in felling and bucking trees comprising: a main body portion having a narrow end and a butt end defining a planar surface of a determined dimension and sides that diverge from the narrow end to the butt end, and a cap having a planar surface of said determined dimension and a lug depending therefrom, said planar surfaces of the butt end and cap being in superimposed abuttment with said lug being embedded in the main body portion at the butt end thereof to permanently secure the cap to the butt end of the main body portion, said main body portion constructed of a material softer than the material of the cap whereby the main body portion is relatively more compatible to being cut by the chain saw and the cap is relatively more compatible to being struck by a driving mall.

4,451,025
HAND RAILING ASSEMBLY

Vittorio Spera, Quebec, Canada, assignor to Speral Aluminium Inc., Quebec, Canada

Filed Feb. 25, 1983, Ser. No. 469,762
Claims priority, application Canada, Sep. 16, 1982, 411579
Int. Cl.³ E04H 17/14
U.S. Cl. 256—65 **6 Claims**



1. In a hand railing assembly having a hand rail, a bottom rail, a plurality of spaced apart vertical posts, each post having a top end connected to the hand rail and a lower end for mounting in a support means, a plurality of vertical pickets spaced between the posts, each picket having a top end connected to the hand rail and a lower end connected to the bottom rail, the improvement comprising,

a hand rail support strip extending along the length of the hand rail having holes spaced apart along the length to hold the top ends of the posts and pickets;

a member having a T-shaped cross section, the member having a stem with sides sloped downwards and outwards, to slide into locating slots in the top ends of the pickets and posts, the member having a top flange whose ends slide in side slots in the hand rail support strip to lock the hand rail support strip to the top ends of the posts and pickets;

a hand rail cap slidingly engaging and locking the hand rail support strip to cover the hand rail support strip, the member and the top ends of the posts and pickets;

a bottom rail support strip extending along the length of the bottom rail having holes spaced apart along the length to hold the posts and the lower ends of the pickets; and

a member having the same T-shaped cross section as that used with the hand rail support strip, inverted to slide into locating slots in the lower ends of the pickets between the posts, the member having an inverted top flange whose ends slide in side slots in the bottom rail support strip to lock the bottom rail support strip to the lower ends of the pickets.

4,451,026
CLAMPING DEVICE

Robert L. Coope, Phoenix, Ariz., assignor to Stevens Engineering, Inc., Phoenix, Ariz.

Filed Jun. 30, 1982, Ser. No. 393,744
Int. Cl.³ B23Q 3/08
U.S. Cl. 269—24 **7 Claims**

1. A clamping device for engaging a workpiece and for releasably anchoring said workpiece to a supporting surface, said clamping device comprising:

a. a housing securable to said supporting surface;

b. a clamping member movably carried by said housing;

c. guide means including,

i. a cavity formed in said housing and having spaced apart upper and lower surfaces,

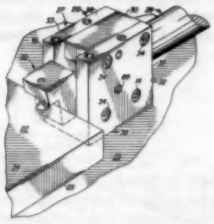
ii. a lower surface formed on said clamping member and slidably disposed upon the lower surface of said cavity, said guide means directing said clamping member in a first direction substantially parallel to said supporting surface;

d. stop means for terminating movement of said clamping member in said first direction; and

e. translation means including,

i. a fulcrum carried by said clamping member and movable along the upper surface of said cavity,

ii. a drive member for receiving a linear force,



iii. an inclined link having a lower end pivotally connected to said clamping member, and an upper end with a bearing surface,

iv. attachment means intermediate the ends of said link movably affixing said link to said drive member,

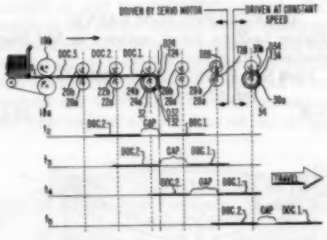
v. means for urging the bearing surface of said link toward the upper surface of said cavity,

said translation means causing said clamping member to move in a second direction toward said supporting surface subsequent to termination of movement in said first direction.

4,451,027
CONSTANT SPACING DOCUMENT FEEDER

Daniel D. Alper, Ypsilanti, Mich., assignor to Burroughs Corp., Detroit, Mich.

Continuation of Ser. No. 110,593, Jan. 9, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,156
Int. Cl.³ B65H 3/52, 5/34
U.S. Cl. 271—10 **7 Claims**



6. In a document feeder for delivering intermixed documents of different lengths at a preselected speed and with preselected gaps between documents, an arrangement comprising:

first means for receiving and transporting a first and a second document at variable speeds;

second means coupled to receive said succession of documents and transport them at a higher range of variable speeds;

means coupled between the first and second means to provide a fixed ratio of speed between the first and second means and thus to develop a gap between said first and second documents controlled respectively by said first and second means;

third means operable at a fixed speed to receive each of the documents of said succession of documents and transport it at a preselected speed; and

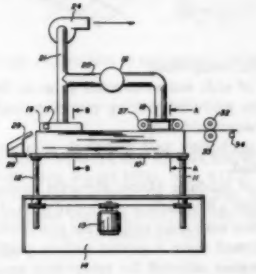
means, responsive to the passage of the documents, to provide signals of use in varying in speed of said first and second means in a manner to enable adjustment of the gap between a first document having a fixed speed under control of the third means and a second document under control of the second means and adjustment of the speed of travel of said second document to a fixed value as said second document is delivered to control by said third means.

4,451,028

SHEET FEEDING APPARATUS

Maurice F. Holmes, Rochester, and Gerald M. Garavuso, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,159
Int. Cl.³ B65H *3/14*
U.S. Cl. 271—11 **27 Claims**



1. A sheet feeding apparatus comprising a sheet stack support tray, a rear vacuum plenum chamber positioned over the rear portion of said sheet stack support tray and adapted to acquire the rear portion of a sheet when sheets are in said tray, a front vacuum plenum chamber positioned over the front of said sheet stack support tray and adapted to acquire the front portion of a sheet when sheets are in said tray, said rear and front vacuum plenum chambers each having a portion positioned in its bottom center to provide a center corrugation member parallel to the sheet feeding direction, sheet transport means associated with said front vacuum plenum to transport the sheet acquired by said front vacuum plenum in a forward direction out of said sheet stack support tray, and air knife means positioned at the rear of said sheet stack support tray and adapted to inject air between the trailing edge of the top sheet in a stack of sheets and the remainder of the stack when a stack of sheets is in said tray.

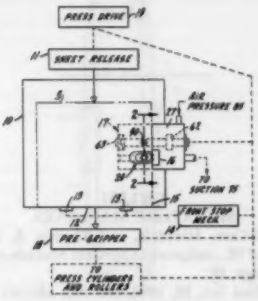
4,451,029

ARRANGEMENT FOR LATERAL ALIGNMENT OF SHEETS

Wolfgang Wildmann, Offenbach am Main, and Rudolf Melzer, Hainburg, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,000
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131279
Int. Cl.³ B65H *9/04*
U.S. Cl. 271—236 **6 Claims**

1. In a device for registering a sheet against front and side stops on the feed table of a printing press having a press drive and having means for cyclically feeding sheets across the table toward the front stop, the combination comprising a suction head recessed in the table adjacent the side stop and having a top surface including a set of openings, means mounting the suction head for movement parallel to the surface of the table with the top surface of the head being maintained flush with the surface of the table, reciprocating means coupled to the press drive and timed with the arrival of the sheet at the front stop for shifting the head laterally in the direction of the side stop and for returning it, a source of suction, first valve means coupled to the source of suction for applying a draft of suction to the head timed with the lateral shifting movement so that the sheet is affirmatively shifted into contact with the side stop, a source of substantially constant air pressure, second valve



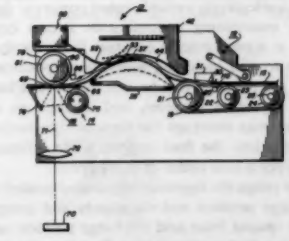
means coupling the head to the source of air pressure for applying a short puff of air to the openings timed with completion of the shifting movement to free the sheet from the head in readiness for removal of the sheet from the table, and an auxiliary nozzle recessed in the table in a position ad3acent the head, said nozzle being permanently connected to the source of air pressure and directed toward the side stop and approximately parallel to the surface of the table for producing a moving film of air under the sheet in the direction of the side stop to insure that the sheet remains against the side stop when the suction is no longer effective and until the sheet is removed from the table.

4,451,030

DOCUMENT STORAGE CHAMBER FOR COUPLING ASYNCHRONOUSLY OPERATED DOCUMENT FEEDING DEVICES

Dennis P. Teeter, Penfield, and Brian R. Ford, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,663
Int. Cl.³ B65H *3/04, 29/20*
U.S. Cl. 271—265 **6 Claims**



1. A chamber for temporarily storing portions of a document in accommodation of divergent speeds and drive strength mismatch between document feeders at the chamber inlet and outlets comprising:

means forming a flexible support for the portion of the docu-

ment in said chamber, said flexible support permitting said document portion in said chamber to rise and fall in accordance with the amount of said document portion present in said chamber;

a sensor cooperable with said support and engageable with any document portion supported by said support for sensing the level of said document portion in said chamber; and

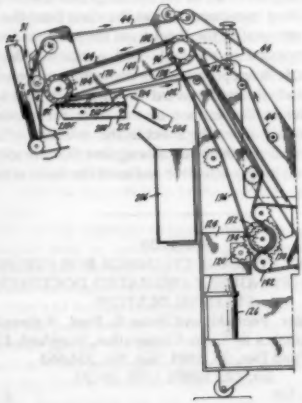
control means for starting and stopping the inlet document feeder in response to preset minimum and maximum levels of said document portion in said chamber.

4,451,031

SIGNATURE MACHINES

William B. McCain, Hinsdale, and Thomas A. Nelson, Oak Lawn, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Jan. 18, 1982, Ser. No. 340,361
Int. Cl.³ B65H 29/66
U.S. Cl. 271—303 5 Claims



1. In a signature feeding machine which includes conveyor means and a selectively variable speed conveyor drive and feed means for maintaining a continuous stream of overlapped signatures at a substantially constant feed rate from a supply hopper up to and including a discharge position where the signatures are dropped one by one into a feed hopper which supplies a signature gatherer, and wherein an operator by intervention may interrupt the flow of signatures of the prevailing order into the feed hopper while substituting in the supply hopper a new order of signatures:

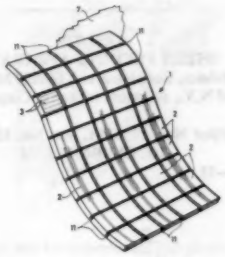
means to purge the upstream signatures located between the discharge position and the supply and comprising a receiver spaced from said discharge position and to which the purged signatures are to be diverted, guide means spaced from the conveyor means and located adjacent the receiver for guiding the purged signatures to the receiver, and means selectively to increase the speed of the drive and feed means and consequently the speed of the conveyor means during diversion.

4,451,032

PLASTIC SKI SLIDE

Gijsbrecht H. J. van Olst, Va Amersfoort, Netherlands, assignor to Nederlandse Kuntstofindustrie Soesterberg, Soesterberg, Netherlands

Filed Nov. 9, 1981, Ser. No. 319,648
Claims priority, application Netherlands, Nov. 10, 1980, 8006130
Int. Cl.³ A63B 69/18
U.S. Cl. 272—56.5 SS 1 Claim



1. A ski slide, comprising:

a plurality of rods interconnected so as to form a support foundation gridwork having predetermined spacing defined between said rods;

means for anchoring said gridwork to a ground support surface; and

a plurality of modular plastic elements having means projecting from a first surface portion of each of said elements for coaction with a ski, and further comprising connecting means formed upon a second surface portion, said connecting means adapted for removably securing each of said elements to said gridwork and adapted for lateral and longitudinal registration and connection with said gridwork, such that connection of said elements with said gridwork defines a mutual spacing between each of said elements for permitting expansion of said elements without contact therebetween.

4,451,033

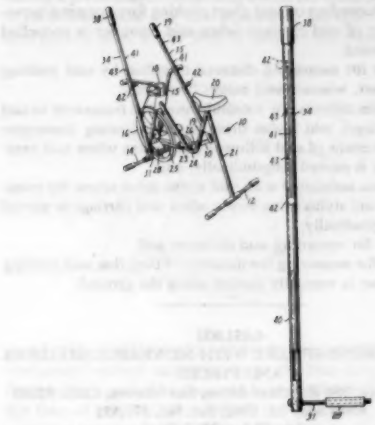
UPPER BODY EXERCISER FOR A STATIONARY BICYCLE AND A BICYCLE INCLUDING THE SAME

Sander C. Nestegard, 3458 Glen Oakes, White Bear Lake, Minn. 55110

Filed Oct. 5, 1981, Ser. No. 308,572
Int. Cl.³ A63B 23/02, 23/04
U.S. Cl. 272—73 2 Claims

2. In a stationary bicycle exerciser having a frame, a seat supported on the frame, a sprocket from which radial arms extend, means for resisting rotation of said sprocket, the improvement comprising shafts extending perpendicular from the radial arms, pedals rotatably mounted on said shafts adjacent said radial arms, weighted arms pivotally connected at one end on said shafts and having a handle adjacent the opposite end, said weighted arms each comprising an elongate hollow tube having a longitudinal slot herein and at least one angularly positioned slot communicating with said longitudinal slot, a cylindrical rod supported in each said hollow tube, and a handle connected to said cylindrical rod and extending

through said longitudinal slot for movement of said cylindrical rod closer to or farther from said one end and engageable with



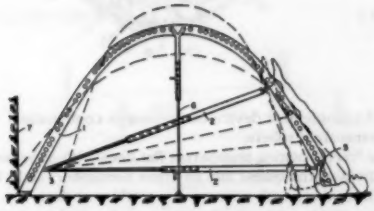
said at least one positioned slot to retain said rod in an alternate position.

4,451,034

DEVICE FOR YOGA EXERCISING

Abram Gin, 99-40 63rd, Forest Hills, N.Y. 11375

Division of Ser. No. 851,624, Nov. 15, 1977, Pat. No. 4,307,880.
This application Dec. 15, 1981, Ser. No. 331,030
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—93 **12 Claims**



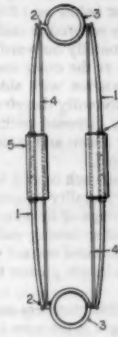
1. A Yoga exercising device, comprising an elongated resiliently deformable element movable to a position in which it is convex and fixedly retained in said position so that a practitioner resting on said element from outside assumes a candle-like posture, said resiliently deformable element having two ends spaced from one another in the direction of elongation thereof, a central plane spaced an equal distance from said ends, and two portions each located between said central plane and a respective one of said ends; means for retaining said resiliently deformable element in said convex position and including an elongated connecting element detachably bracing said resiliently deformable element from inside in said position, said connecting element having two end sections spaced from one another in the direction of elongation thereof, one of said sections of said connecting element being connected to said resiliently deformable element in the region of one of said ends of the latter, and the other section of said connecting element being connected to said resiliently deformable element in the region located between said central plane and the other end of the latter; and means for connecting said other section of said connecting element to said resiliently deformable element in a plurality of locations between said central plane and the other end of said resiliently deformable element.

4,451,035

PULL AND RELEASE EXERCISE DEVICE

Joseph Manzi, New York, N.Y., assignor to Gossling Development Corporation, New York, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,623
Int. Cl.³ A63B *21/02, 21/32*
U.S. Cl. 272—137 **1 Claim**



1. A hand held grymnastic devices for pull and pull-relaxation exercise comprising:

two elongated members, a pair of handgrips and two reinforcing members;

each of said two elongated members forming major and secondary coils,

said major coils being formed intermediate to the ends of each of said elongated members,

said secondary coils formed adjacent to and on opposite sides of said major coils,

said ends of said elongated members being joined to each other to form a continuous member,

each of said reinforcing members having means at their ends to engage said secondary coils,

said pair of handgrips adapted to receive the respective joined ends of said elongated members,

means located on said handgrips for receiving and securing said reinforcing member thereto,

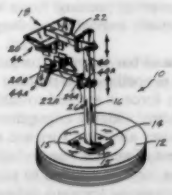
means located on said handgrips for adding stability to the elongated members.

4,451,036

BATTING PRACTICE DEVICE

Bernard J. Sinclair, 7211 SW. 11th St., Des Moines, Iowa 50315, and Dominic R. Mauro, 1629 E. Virginia St., Des Moines, Iowa 50320

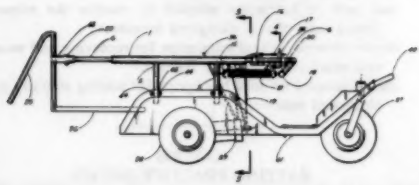
Filed Jul. 2, 1981, Ser. No. 279,720
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 R **2 Claims**



1. A batting practice device, comprising,

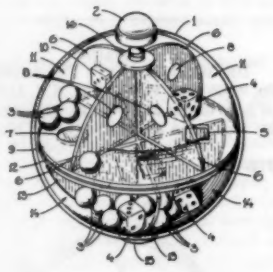
a vertically disposed support post,
a first clamp means selectively vertically movably mounted on said post,
a first arm resiliently secured to said first clamp means and extending horizontally outwardly therefrom,
a first frame means at the outer end of said first arm and having a bottom portion with side portions extending upwardly and outwardly therefrom,
a plurality of vertically disposed resilient members secured to said first frame means extending downwardly from the bottom portion thereof,
a second clamp means selectively vertically movably mounted on said post below said first clamp means,
a second arm resiliently secured to said second clamp means and extending horizontally outwardly therefrom,
a second frame means at the outer end of said second arm and having a top portion with side portions extending downwardly and outwardly therefrom,
a plurality of vertically disposed resilient members secured to said second frame means and extending upwardly from the top portion thereof,
the resilient members on each of said first and second frame means comprising a plurality of groups of flexible members, each of said groups of flexible members including a middle flexible member having outer flexible members positioned on opposite sides thereof with the middle flexible member having a length greater than the outer flexible members,
said groups of said flexible members on said first and second frame means defining a strike zone therebetween,
said first and second frame means being vertically adjustable movably mounted with respect to said support post to permit the height of the strike zone to be varied,
said first and second frame means being movable towards and away from each other to permit the flexible members on said first and second frame means to be moved towards one another or away fron one another.

4,451,037
MOBILE PUSHING EXERCISER
Thomas J. O'Hare, 81 Thornton Dr., Chalmette, La. 70043
Filed Mar. 2, 1981, Ser. No. 239,651
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—55 R **4 Claims**



1. A mobile pushing exerciser, which comprises:
a. a pushing carriage, said carriage being mounted on a wheel assembly; moveable along the ground;
b. means for providing a variable resistance to the movement of said pushing exerciser;
c. means for measuring pushing force when said pushing exerciser is manually moved along the ground, said means comprising:
i. at least one hand bar mounted on said pushing carriage for manually propelling said pushing exerciser along the ground when force is applied to said hand bar;
ii. means providing slidable engagement of said carriage on said exerciser allowing forward and backward slidable movement of said carriage relative to said exerciser when pushing force is applied to said carriage;
iii. means for restraining forward sliding movement of said carriage when said pushing force is applied thereto;
iv. a surface area rigidly connected to said carriage for receiving a chart thereonto, said surface being substantially parallel with the ground;
v. follow arm means moveable in a transverse direction for recording on said chart pushing force causing movement of said carriage when said exerciser is propelled forward;
d. means for measuring distance travelled by said pushing exerciser, wherein said means comprises;
i. a stylus drive screw rotatably mounted transverse to said carriage, said stylus drive screw allowing transverse movement of said follower arm means when said exerciser is moved longitudinally; and
ii. means associated with said stylus drive screw for rotating said stylus drive screw when said carriage is moved longitudinally;
e. means for recording said distance; and
f. means for measuring the duration of time that said pushing exerciser is manually pushed along the ground.

4,451,038
TRANSPARENT SPHERE WITH MOVEABLE DIVIDERS AND PIECES
Bela A. Nagy, 854 Ranchero Drive, San Marcos, Calif. 92069
Filed May 13, 1982, Ser. No. 377,692
Int. Cl.³ A63F *7/04*
U.S. Cl. 273—110 **4 Claims**

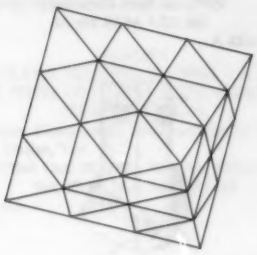


1. An amusement device comprising in combination:
a transparent sphere;
two freely rotating transparent flat discs within the housing dividing the sphere into an upper hemisphere and a lower hemisphere with openings for marbles or dice;
two arcuate segments dividing each hemisphere into four compartments each identified by a printed or scribed colored ball or die;
seven groups of glass or plastic marbles each of a different color;
a group of dice only one surface of each which has sharp edges to assist in moving the dice through the square opening;
and, an upper and lower handle located outside the disc fastened to the segments so that they will rotate with the handles.

4,451,039
MAGIC OCTAHEDRON
Clarence W. Hewlett, Jr., 920 Northgate Ave., Waynesboro, Va. 22980
Filed Feb. 9, 1982, Ser. No. 347,183
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **10 Claims**

6. A mechanical puzzle comprising a plurality of component first units of a first shape and a plurality of component edge and corner second units of different shape wherein each of said second units have a larger number of faces than said first units,

a central member, means for retaining such component first and second units into a main unit about said central member having a given shape, comprising means for retaining each face of each component first unit adjacent to the face of a component second unit, to the face of said central member, or ex-



posed to the outside world, and for retaining each face of each component second unit adjacent to the face of a component first unit or exposed to the outside world but not adjacent to the face of said central member, and means for rotationally attaching interior faces of eight selected ones of said component first units at given angles to said central member.

4,451,040

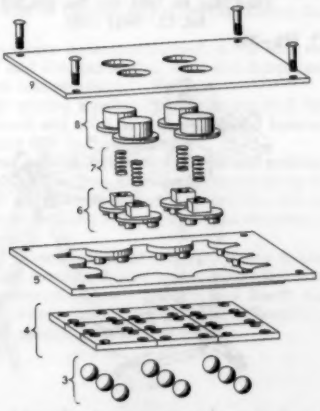
TABULAR PUZZLE

Jonathan J. Ashley, 3367 N. McCall, Sanger, Calif. 93657

Filed Jun. 22, 1982, Ser. No. 391,165

Int. Cl.³ A63F *9/08*

U.S. Cl. 273—153 S **1 Claim**



1. A puzzle comprising a rectangular array of square tablets inclosed in a frame and a tray, each of said tablets being marked with an index which establishes its identity and orientation; a number of knobs, one being at each point of said array where four tablets meet at a common corner, each of said knobs engaging its surrounding four tablets and, upon being depressed and rotated, depressing and rotating said four surrounding tablets, and, upon being released after a rotation by some multiple of 90°, popping up along with said four surrounding tablets to its original level above said tray.

4,451,041

GOLF CLUB HEAD AND A METHOD FOR MANUFACTURING THE SAME

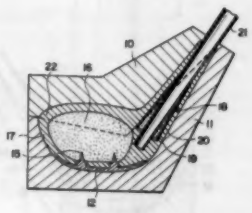
Keijiro Hayashi, Takatsuki; Toshimi Awano, Ohogaki; Masayuki Yoshikawa; Kouzou Yazawa, both of Gifu, and Takashi Ito, Ohogaki, all of Japan, assignors to Mizuno Corporation, Osaka, Japan

Filed Feb. 4, 1983, Ser. No. 463,891

Claims priority, application Japan, Feb. 5, 1982, 57-18002; Feb. 18, 1982, 57-25629; Apr. 8, 1982, 57-59286

Int. Cl.³ A63B *53/06*

U.S. Cl. 273—167 H **9 Claims**



1. A golf club head comprising a shell of carbon fiber reinforced plastic comprising carbon short fibers impregnated with synthetic resin, a core embedded in said shell to reduce the head weight, a metal sole member positioned on the bottom of said shell and having a plurality of pins extending from the inner surface thereof through said shell into said core to position and retain said core in said shell and an upwardly converging neck reinforcement embedded in the neck portion of said shell.

4,451,042

GOLF CLUB HEAD OF CARBON FIBER REINFORCED PLASTIC

Keijiro Hayashi, Takatsuki; Toshimi Awano, Ohogaki; Masayuki Yoshikawa; Kouzou Yazawa, both of Gifu, and Takashi Ito, Ohogaki, all of Japan, assignors to Mizuno Corporation, Osaka, Japan

Filed Apr. 7, 1983, Ser. No. 482,726

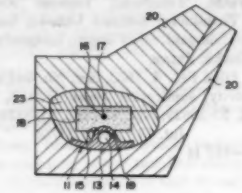
Claims priority, application Japan, Apr. 7, 1982, 57-58630; Apr. 7, 1982, 57-58629

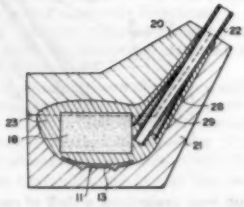
Int. Cl.³ A63B *53/06*

U.S. Cl. 273—171 **8 Claims**

1. A golf club head comprising a shell of carbon fiber reinforced plastic, a core embedded in the center portion of said shell to reduce the head weight, a metal sole member including integral side and sole portions so arranged as to cover the side and the bottom of said shell, respectively, projections on said

metal sole member inserted into said core to position and retain it in said shell, and pocket means in said metal sole member for





containing weights to be used for adjustment of the head or balance adjustment.

4,451,043

GOLF TRAINER

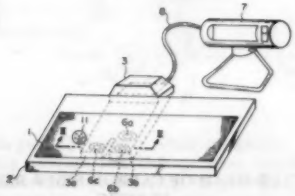
Koji Ogawa; Hiroaki Taguchi; Takao Tsutsumi; Yoshinori Yasuda, and Akio Takase, all of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 419,093

Claims priority, application Japan, Sep. 16, 1981, 56-137219[U]; Jan. 21, 1982, 57-6199[U]; Jan. 21, 1982, 57-6201[U]

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—186 R **13 Claims**



1. A golf trainer, comprising:

a base on which a golf ball is placed,

one or more sensors installed in said base for detecting the moving state of a swinging club head to produce output signals,

means for receiving said detected output signals and processing these signals to display the same as various information relative to the club swing,

a sensor case distinct from said base for holding said sensors in position therewithin, and

one or more recesses formed in said base for removably installing said sensor case therein.

4,451,044

GOLF TRAINING AID

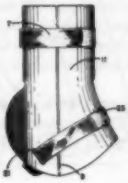
Denvier D. Elliott, Jr., 4512 Galaxy Ave., Las Vegas, Nev. 89102

Filed Oct. 5, 1981, Ser. No. 308,415

The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—189 A **6 Claims**



1. In a golf training device for attachment to a golfer's forearm and wrist comprising a sleeve portion adapted to fit around the lower forearm and wrist, attachment means for retaining said sleeve portion in place and a hand restricting portion extending from the sleeve portion and fully overlying the back of the golfer's hand, said two portions generally comprising a rigid wall having its length extending from the golfer's lower forearm over first set of knuckles on the hand, the improvement therein which comprises a substantially straight hinge extending the entire length of the device approximately centrally located in said rigid wall and dividing said wall into first and second sections, means for connecting said first and second sections to said hinge, and fastening means for firmly holding the hand-restricting portion of the device immediately proximate to the back of the golfer's hand.

4,451,045

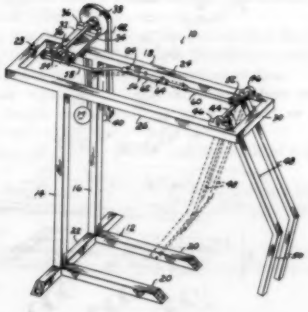
STEER OR CALF LEGS PRACTICE ROPING DEVICE

Charles E. Fesmire, P.O. Box 619, Helena, Okla. 73741

Filed May 16, 1983, Ser. No. 495,309

Int. Cl.¹ F41J *9/00*

U.S. Cl. 273—338 **5 Claims**



1. An animal rear leg practice roping device for a mounted roper, comprising:

upright open frame means including an elongated elevated top frame portion having forward and rearward ends horizontally supported in cantilever fashion;

pulley drive shaft means transversely overlying the forward end portion of said top frame;

motor means drivably connected with said pulley drive shaft means;

rock shaft means transversely overlying the other end portion of said top frame;

a pair of laterally spaced steer rear leg simulating arms connected with and depending from said rock shaft means; and,

rod means connecting said pulley drive shaft means with said rock shaft means for pivoting said leg simulating arms forwardly and rearwardly through an arc of predetermined magnitude.

4,451,046

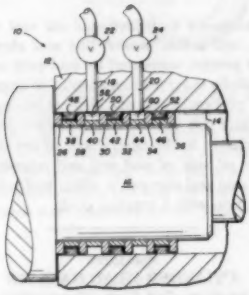
APPARATUS FOR SEALING BETWEEN A SHAFT AND HOUSING WITH MULTIPLE LAND MEMBERS AND SEAL MEMBERS

David L. Bliven, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 20, 1982, Ser. No. 435,537

Int. Cl.³ F16J *15/44, 15/46*

U.S. Cl. 277—3 **4 Claims**



1. A shaft sealing system for use in apparatus including a shaft and a housing, through which the shaft extends, and wherein relative rotation occurs between the shaft and housing, said system comprising:

first, second, third, fourth, fifth and sixth annular land members located on the shaft and projecting toward the housing;

an annular spacer member positioned on the shaft between each of said first and second, third and fourth, and fifth and sixth land members;

an annular spacing member located on the shaft between said second and third land members and between said fourth and fifth land members;

first, second, and third generally annular seal members frictionally engaging the housing and respectively located between and in close proximity to said first and second, third and fourth, and fifth and sixth land members, respectively; and,

means for providing fluid at one pre-selected pressure between said second and third land members and at a different pre-selected pressure between said fourth and fifth land members whereby the pressure differential across each seal member can be controlled.

4,451,047

SEAL

David P. Herd, and Duane E. Gibson, both of Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 288,742, Jul. 31, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,533

Int. Cl.³ F16J *15/18*

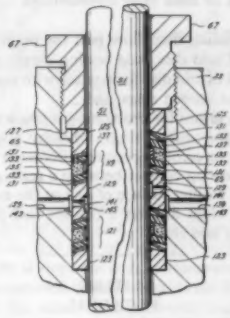
U.S. Cl. 277—26 **20 Claims**

1. Apparatus for sealing in high pressure, temperature cycled applications between the walls of an axially movable valve stem and a stuffing box around the valve stem, the stuffing box having a port in its bottom and the valve stem extending through the port and out of the stuffing box, such sealing apparatus being preloaded to a stress higher than the stress expected to be encountered in service, comprising:

first and second elastic metal ring gaskets disposed in such stuffing box around such valve stem, each gasket being compressed into metal-to-metal sealing engagement with both of such walls, and

annular compliant seal means disposed in such stuffing box around such valve stem and sandwiched between said gaskets,

said seal means including first and second annular portions of tough, compliant material adjacent said first and second



gaskets, respectively, each annular portion being compressed into sealing engagement with both of such walls, and a core portion disposed between said first and second portions and composed of a material having a lower coefficient of thermal expansion than said material of said first and second annular portions, the relative volume of said core portion with respect to said first and second annular portions being such that upon such temperature cycling, the thermal expansion of said annular compliant seal means is less than that which would cause loss of such preload stress.

4,451,048

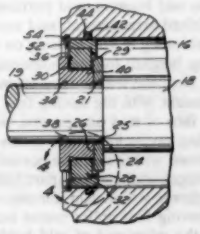
HIGH SPEED SHAFT SEAL

Steve J. Pick, 10551 Park Villa La., Villa Park, Calif. 92667

Filed Sep. 28, 1982, Ser. No. 425,562

Int. Cl.³ F16J *15/34, 15/48*

U.S. Cl. 277—27 **11 Claims**



1. A dynamic shaft seal for bidirectional restriction of fluid flow along a rotating shaft, comprising:

a first ring having a central opening for fluid-tight mounting of said ring on said shaft for rotation, said first ring having a flat radial face providing an axially directed sealing surface;

a second ring having a central opening for fluid-tight mounting of said ring on said shaft for rotation, said second ring having a flat radial face to provide an axially directed

sealing surface, said second ring face opposing said first ring face;

means for spacing said second ring face a measured distance from said first ring face;

a disc having substantially flat radial sides providing axially directed sealing surfaces adapted to engage said flat face of said first and second ring, said disc sized narrower in width than said measured distance to allow said disc a range of axial movement such that a side of said disc may contact a face of one or the other of said first or second rings, said disc having a central opening through which said shaft extends which is sized to provide a clearance for restriction of fluid flow therethrough without frictional contact;

means for sealing fluid flow past the outer circumferential surface of said disc, said sealing means permitting axial movement of said disc for contact with one or the other of said first or second rings; and

positive stop means for prohibiting rotation of said disc with said first and second rings, whereby said disc is axially moved by force of a pressure differential across said disc to make bearing contact between a sealing surface of said disc and a sealing surface of one or the other of said first or second rings to form a contact seal prohibiting fluid flow along said shaft.

4,451,049

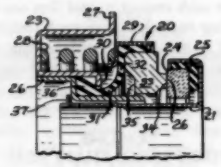
FACE SEAL

Frank J. Charhut, Northfield, Ill., assignor to Chicago-Allis Mfg. Corp., Chicago, Ill.

Division of Ser. No. 159,808, Jun. 16, 1980, abandoned. This application May 6, 1982, Ser. No. 375,397

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—42 **7 Claims**



1. In a face seal cartridge assembly for sealing a rotatable shaft in a fluid filled housing, said assembly consisting of a rotor portion for securement on said shaft and a stator portion for securement in said housing, said portions being connected together in a unitized arrangement, said assembly adapted for compressible positioning in said housing on said shaft within a designed working heighth tolerance dimension, each portion having a sealing face, the sealing face of one portion being in face to face abutment with the sealing face of said other portion, the sealing face of said one portion being carried by an annular sealing ring having an annular recess therein, a resilient membrane contained within said one portion adapted for flexing within said dimension, spaced apart holding means maintaining said membrane within said dimension, one end of said holding means having first collar means securing one end of said membrane, the other end of said holding means having second collar means engaging the other end of said membrane over said sealing ring, a spring arranged between and having an end bearing on each of said collar means, each end of said holding means being free to move axially responsive to an axial deflection of the shaft relative to the housing, and a deformable bellows on said membrane between the ends of said holding means retained folded and adapted for flexing into said recess within said dimension for taking up and dampening torque transmitted from said sealing faces during rotation of said rotor portion relative to said stator portion.

4,451,050

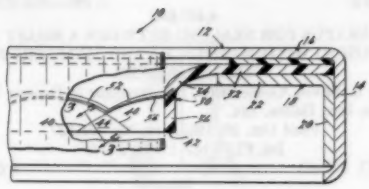
BI-DIRECTIONAL HYDRODYNAMIC SLITTED SEAL

James A. Repella, Berkley, Mich., assignor to Microdot Inc., Darien, Conn.

Continuation-in-part of Ser. No. 322,640, Nov. 18, 1981, abandoned. This application May 16, 1983, Ser. No. 494,817

Int. Cl.³ F16J *15/32, 15/54*

U.S. Cl. 277—134 **8 Claims**



1. A bi-directional hydrodynamic oil seal comprising an annular case, and a thin washer-like seal element having a radially outer portion supported by said case and a generally cylindrical radially inner portion adapted to engage a shaft, the radially inner portion of said seal element having a plurality of generally arcuate slits in the surface thereof that extend at an acute angle relative to the central axis of the shaft and divergent from the oil side of said seal and intersect the radially inner edge of said seal element to effect hydrodynamic pumping in conjunction with a rotating shaft.

4,451,051

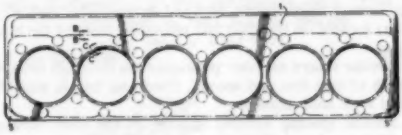
CYLINDER HEAD GASKETS

Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, County Durham, England

Filed May 18, 1982, Ser. No. 379,443

Int. Cl.³ F16J *15/08*

U.S. Cl. 277—235 B **2 Claims**



1. A gasket for sealing the joint between the cylinder block and the cylinder head of a dry liner internal combustion engine and comprising a first outer metal plate intended to be placed next to said cylinder block, a second outer metal plate and a central composite metal plate disposed between the first and second outer plates, said central plate comprising a central soft metal layer and hard metal surface layers integral therewith, the outer plates having at least one wave form corrugation therein, characterised in that between each of the cylinder bore openings in the gasket at least one shim is welded to the surface layer of the side of the central composite metal plate adjacent said first outer metal plate.

4,451,052

INTEGRAL CYLINDER LIFT MECHANISM

Martin J. Gagelin, Wahpeton, N. Dak., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 5, 1981, Ser. No. 318,385

Int. Cl.³ A01B *63/22*

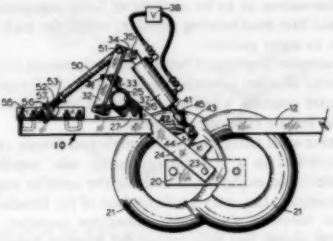
U.S. Cl. 280—43.23 **9 Claims**

1. In an implement lift mechanism comprising a vehicle frame, support wheel means for said frame, an axle leg mounting said support wheel means at a first end thereof, said axle leg

having a second end thereof rotatably mounted relative to the frame, the improvement comprising:

a mast assembly rotatably mounted on the frame about the same axis as the axle leg and extending upwardly therefrom;

first link means connected between said mast assembly and said frame, said first link means being adjustable to permit adjusting the position of the mast assembly; and



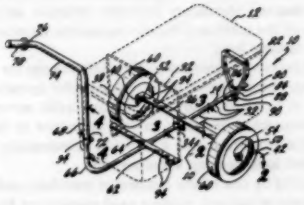
second link means extending between said mast assembly and said axle leg, said second said link means comprising an extendable and retractable hydraulic cylinder to cause the axle leg to rotate about its axis of mounting, the second link means carrying the load from the axle leg to the mast and the first link means reacting the load from the rotatably mounted mast assembly to the frame.

4,451,053

HAND CART

Daniel Alioa, 13735 McKenzie Ave., and Richard E. Stevens, 13727 McKenzie Ave., both of Poway, Calif. 92064

Filed Oct. 13, 1981, Ser. No. 310,490
Int. Cl.³ B62B 1/12
U.S. Cl. 280—47.26 **6 Claims**



1. An improved load bearing hand truck comprising:

a single longitudinal support member having an upwardly curved end;

a first and second load support member, said members positioned substantially transverse to and carried by said single longitudinal support member, said first load support member to rotatably secured to said single longitudinal support for rotation thereabout and rotatably supporting a wheel on each outer end thereof, said second load support member being spaced from said first load support member toward said upwardly curved end;

a handle member removably attached to the upwardly curved end of said single longitudinal support member and extending therefrom in a first direction, angled upwardly in a second direction and downwardly in a third direction forming a handle on the distal end thereof; and

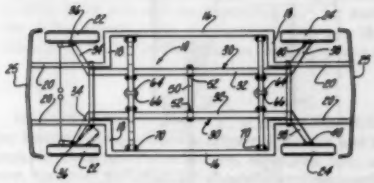
a single load steadying member carried by and sectionally positionable along said single longitudinal support member for adjustment to load size, said load steadying member is positionable between said first load support member and the distal end of said single longitudinal support member.

4,451,054

VEHICLE SUSPENSION SYSTEM

William D. Allison, 39 Randor Cir., Grosse Pointe Farms, Mich. 48236

Filed May 11, 1982, Ser. No. 377,084
Int. Cl.³ B60G 11/08
U.S. Cl. 280—104 **11 Claims**



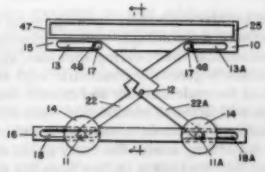
1. A suspension system for the body of a wheeled vehicle comprising: a pair of elongated longitudinally extending and spaced apart rails, said pair of rails each supporting ground engaging wheels at opposite ends, a transverse beam having opposite ends supported relative to said rails for oscillation of said rails about the axis of said transverse beam separately of each other, leaf spring means extending transversely of and having end parts extending outwardly of said rails, means connecting spaced portions intermediate of the ends of said leaf spring means to said rails, additional means connecting opposite ends of said spring means to opposite sides of said body whereby ground engaging loads and movement imposed on said wheels at one end of one of said rails is transmitted to wheels at the other end of said one of said rails and through said leaf spring means and said transverse beam to the wheels associated with said other rail, said wheels being simultaneously moveable in substantially parallel planes in response to displacement of any one of said wheels and said body being resiliently supported relative to said rails by said end parts of said leaf spring means.

4,451,055

PROPULSION MEANS ACTUATED BY WEIGHT

Robert E. Lee, 479 Dean St., Brooklyn, N.Y. 11217

Filed Apr. 11, 1978, Ser. No. 895,511
Int. Cl.³ B62M 1/00; A63C 17/12
U.S. Cl. 280—221 **2 Claims**

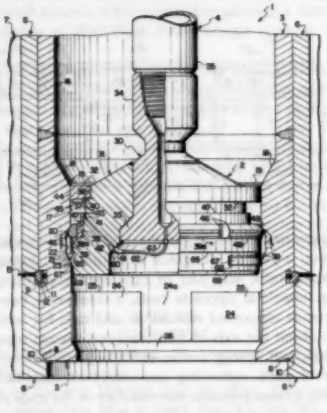


1. In a weight carrier propelled by the oscillation of weight consisting of a lower frame member and an upper frame member; and slots in the upper frame member for guides and slots in the lower frame member for axles; two pair of pivotable arms extending from the guides in the upper frame member to the axles in the lower frame member; clutched pinions mounted on the lower axles; and racks fixedly mounted on the said lower frame member; wherein said clutched pinions engage the said racks when weight forces the upper load frame member downward and forces the axles to turn.

4,451,056
REMOTELY OPERATED UNDERWATER TENSION CONNECTOR

Edward M. Galle, Jr., Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Jul. 18, 1980, Ser. No. 170,970
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ F16L 35/00
U.S. Cl. 285—3 21 Claims



1. In a remotely connectable and remotely releasable connector for securing an elongated generally upright upper member to a lower member in such fashion that large tension loads can be applied from one member to the other via the connector, the combination of

a female connector member to be secured to one of the upper member and the lower member and having

a bore having a generally cylindrical wall, said bore being open at one end,

a generally frustoconical entry guide surface located at said one end, the entry guide surface being concentric with the bore and tapering inwardly and toward the opposite end of the bore,

the wall of the bore including a transverse first load-bearing shoulder spaced from the entry guide surface and facing generally toward said opposite end of the bore;

a male connector member to be secured to the other of the upper member and the lower member and having

a generally cylindrical outer surface dimensioned to be telescopically disposed in the bore of the female member, and

a transverse annular outwardly opening recess defined by a first side wall, a second side wall constituting a second transverse annular load-bearing shoulder, and an inner surface which is generally concentric with the longitudinal axis of the male member and extends between said side walls, said first and second side walls being spaced apart axially of the male connector member with the first side wall being nearer the entry guide surface and the second side wall being farther from the entry guide surface when the male member is so telescopically disposed in the female member that both side walls are with said bore, said second load-bearing shoulder then being so disposed as to face toward said first load-bearing shoulder;

annular stop means disposed in said outwardly opening recess and having a third load-bearing shoulder and a fourth load-bearing shoulder,

said third and fourth load-bearing shoulders facing generally away from each other with said fourth shoulder facing toward said second shoulder,

the annular stop means being radially distortable between an outer position, in which the stop means has a larger diameter and the outer diameter of said third load-bearing shoulder is substantially greater than the inner diameter of said first load-bearing shoulder, and an inner position, in which the stop means has a smaller diameter and the outer diameter of said third load-bearing shoulder is less than the inner diameter of said first load-bearing shoulder,

said third load-bearing shoulder being of such shape and dimensions as to be capable of flush engagement with said first load-bearing shoulder when the lock means is in its outer position,

the annular stop means being resiliently biased toward said outer position whereby the stop means will expand to its outer position when not restrained by the bore wall of the female connector member,

relative axial movement of the male and female connector members in a direction to bring said members into telescopic engagement causing the annular stop means to engage the entry guide surface of the female connector member, the female connector member, annular stop means and male connector member having coacting means, operative on continuation of the relative movement of the connector members, to contract the annular stop means toward said inner position and thereby allow the stop means to traverse the bore of the female connector member until the stop means reaches said first load-bearing shoulder and can expand under the influence of the resilient bias toward said outer position, whereupon said first and third load-bearing shoulders will then be mutually engaged when a tension load is applied in a direction tending to withdraw the male connector member from the female connector member, at least one of the female connector member, annular stop means and male connector member being constructed and arranged for prevention of movement of the annular stop means toward its inner position when the first and third load-bearing shoulders are mutually engaged and such tension load is applied, whereby such mutual engagement of said first and third load-bearing shoulders prevents relative axial movement of the male and female connector members under such tension load,

the transverse dimensions of the male connector member and the bore of the female connector member being such as to allow additional relative axial movement of the connector members in said direction to bring the annular stop means to a position substantially beyond the first load-bearing shoulder; and

means carried by one of the connector members and responsive to said additional relative axial movement for at least conditioning the annular stop means for movement to its inner position.

4,451,057
FOOT-REST DEVICE FOR MOTORCYCLES

Louis L. Lawson, 5826 Riva Ridge Dr., Indianapolis, Ind. 46227

Filed Jan. 25, 1982, Ser. No. 342,067
Int. Cl.³ B62J 25/00
U.S. Cl. 280—291 5 Claims

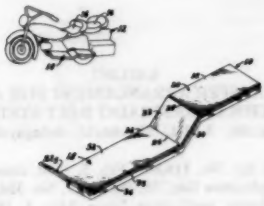
1. A foot-rest device for a motorcycle or the like device in which two riders may sit one behind the other, one rider being the driver and the other rider being the passenger, the motorcycle or like device being provided with forward and rearward support means, and having a forward seat for support of the driver, and having a rearward seat for support of a passenger, and the passenger seat being higher than that of the driver's seat, the foot-rest device comprising:

a pair of foot-rest body members, one being a forward one and the other being a rearward one,

interconnection means by which the two foot-rest body members are rigidly interconnected but at different

heights, the rearward one of the body members being higher than the forward one of the body members, corresponding to the relative heights of the driver's seat and of the passenger's seat; and

support means for supporting the rigid assembly of the pair of foot-rest body members and the interconnection means from the motorcycle device's support means, with the



support of the forward one of the foot-rest body members by the motorcycle device's forward support means thus contributing to the support of the rearward one of the foot-rest body members, and the support of the rearward one of the foot-rest body members by the motorcycle device's rearward support means also contributing to the support of the forward one of the foot-rest body members.

4,451,058

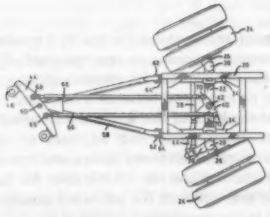
TRANSPORT CONVERTER DOLLY WITH FORCED STEERING

Norman R. Curry, 3493 Rubens Ct., Burlington, Ontario, Canada L7N 3K3

Filed Feb. 3, 1982, Ser. No. 345,432

Int. Cl.³ B62D *13/04*

U.S. Cl. 280—423 A **8 Claims**



1. A transport dolly for the tandem connection of a rearward vehicle to a forward vehicle comprising:

a dolly frame receiving the forward end of the rearward vehicle;

a dolly axle;

a spring dolly suspension mounting the dolly axle on the dolly frame;

at least two transversely-spaced dolly wheels mounted by the dolly axle for steerable movement of the dolly and on which the dolly runs;

steering link connector means pivotally mounted on the dolly frame for pivotal movement about a vertical pivot axis passing centrally through the dolly axle and connected to the dolly wheels for steering motion thereof by pivotal motion of the steering link connector means about the said vertical pivot axis;

a transverse connector bar adapted to be connected to the rear of the forward vehicle so as to be in fixed orientation in the horizontal plane relative to the forward vehicle, and to change its orientation in the horizontal plane relative to the dolly frame as the forward vehicle traverses a turn;

longitudinal towing connector means having one end connected to the dolly frame and the other end pivotally connected at a respective towing pivot point to the transverse connector bar for towing connection of the two vehicles; and

steering connection means comprising at least one logitudinal steering connector, each pivotally connected at one end to the transverse connector bat at a respective steering pivot point transversely spaced from the towing pivot point and connected at the other end to the steering link connector means at a corresponding steering pivot point transversely spaced from the vertical pivot axis for steering motion of the steering link connector means about the vertical pivot axis and corresponding steering motion of the dolly wheels upon displacement between the two vehicles in the horizontal plane as they traverse a turn.

4,451,059

HEELHOLDER FOR SAFETY SKI BINDINGS

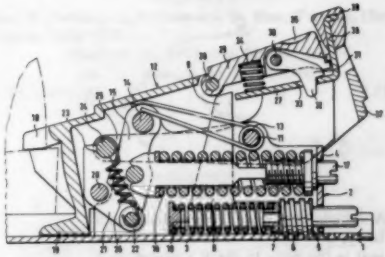
Walter Knabel, Murnau; Ludwig Wagner, Farchant, and Roland Jungkind, Garmisch-Partenkirchen, all of Fed. Rep. of Germany, assignors to MARKER-Patentverwertungsgesellschaft mbH, Baar, Switzerland

Filed Feb. 9, 1982, Ser. No. 347,193

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105294

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—632 **6 Claims**



1. A heelholder for a safety ski binding, said heelholder comprising:

wall means;

a soleholder pivotally mounted on said wall means for movement between open and closed positions, said soleholder being biassed towards the open position and movable to the closed position upon insertion of the heel of a boot into the binding;

lever means mounted on said soleholder and movable between an obstructed position for releasably holding said soleholder in the closed position and an unobstructed position for enabling voluntary movement of said soleholder to the open position;

first locking means mounted on said wall means in the path of said lever means and movable between a locking position for releasably blocking said soleholder in the closed position and a releasing position for releasing said soleholder to the open position in response to predetermined forces applied to said soleholder and transmitted by said lever means to said first locking means;

release controlling spring means for biassing said first locking means towards said locking position;

second locking means pivotally mounted on said wall means and movable between a blocking position for blocking said lever means against movement from said obstructed position and an unblocking position for enabling movement of said lever means to the unobstructed position, said second locking means being biassed towards said blocking position; and

voluntary release means for moving said second locking means from said blocking position to said unblocking position, said voluntary release means including a first toggle member pivotally mounted on said soleholder between inactive and active positions and a second toggle member pivotally mounted on said first toggle member for actuating said second locking means, said second toggle member moving said second locking means to the unblocking position in response to movement of said first toggle member to said active position, to enable the movement of said soleholder to the open position without overcoming the force of said release controlling spring.

4,451,060

DEVICE FOR VEHICLE SAFETY BELTS

Hans Sylvén, Vårgårda, Sweden, assignor to AB Stil-Industri, Vargarda, Sweden

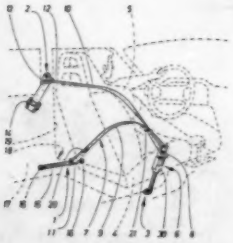
PCT No. PCT/SE81/00181, 371 Date Feb. 12, 1982, 102(e) Date Feb. 12, 1982, PCT Pub. No. WO81/03619, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 17, 1981, Ser. No. 348,487

Claims priority, application Sweden, Jun. 18, 1980, 8004512

Int. Cl.³ B60R 21/10

U.S. Cl. 280—801 **5 Claims**



1. A vehicle comprising, in combination:

(1) a body;

(2) a seat in the body to carry a person; and

(3) a safety belt for the person occupying the seat, comprising

(a) a belt strap;

(b) an upper belt strap mounting in the body adjacent an upper part of the seat at one side thereof and forming a guide bracket through which the belt strap slides;

(c) a reeling device mounted to said body and connected to one end of the belt strap for pulling the belt strap through the guide bracket into the reeling device;

(d) a lower belt strap mounting in the body adjacent a lower part of the seat at said one side thereof and forming an elongated bracket extending lengthwise in the travel direction of the vehicle;

(e) an eye formed by the other end of the belt strap slidably embracing and anchored to the elongated bracket;

(f) a connecting device located at the other side of the seat for releasably anchoring a part of the belt strap extending between the lower and upper mountings; and

(g) a stop on the belt strap for engagement with the upper mounting and thus limiting wind up of the belt strap on the reel when the belt strap is pulled into the reeling device and located at a spacing from said other end of the belt strap in excess of the spacing between the upper mounting and the elongated bracket;

the eye of the belt strap being slidable along the elongated bracket between a first position when the belt strap is anchored to the connecting device; and a second position when the belt strap is released from the connecting device and pulled into the reeling device; the spacing of the first and second positions along the elongated bracket being sufficient to enable the belt strap to be moved aside by sliding the eye along the bracket and thereby facilitate movement of a person into and out from the seat.

4,451,061

BELT TRANSFER ARRANGEMENT FOR A PASSIVE VEHICLE RESTRAINT BELT SYSTEM

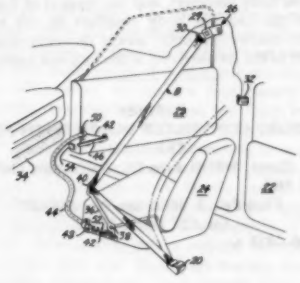
Juichiro Takada, 3-12-1, Shinmachi, Setagayakuku, Tokyo, Japan

Division of Ser. No. 118,841, Feb. 5, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,984

Claims priority, application Japan, Mar. 6, 1979, 54-27531; Mar. 24, 1979, 54-37409

Int. Cl.³ B60R 21/10

U.S. Cl. 280—802 **3 Claims**



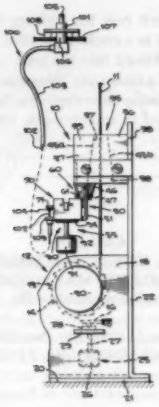
1. A belt transfer arrangement for use in a passive vehicle restraint belt system comprising an arm mounted adjacent the inboard side of the vehicle seat for rotation about a pivot axis for movement of its upper end between a rearward restraining position adjacent the back of the seat and a forward releasing position, and having a guide ring adjacent its upper end through which a restraint belt freely passes, and transfer means coupled between the arm and the vehicle door for moving the upper end of the arm between the rearward position and the forward position in response to movement of the door between the closed position and a partway open position, and including a drive wire coupled between the vehicle door and the arm for transmitting door motion to the arm, a wire sheath slidably receiving the wire and fastened at both of its ends to constrain the wire for motion transfer, a spring means compressed, when the arm is in the rearward restraining position, between a lower end of the arm beneath its pivot axis and a fixed location on the seat forward of the arm, and a lost motion coupling for enabling the door to be moved between the partway open position and a fully open position without imparting further movement to the arm, the lost motion coupling comprising a rod connected to the end of the drive wire and adapted to move the drive wire relative to the wire sheath while the door moves between the closed position and the partway open position, the rod being slidably mounted on the door and the end of the wire sheath near the rod being fastened to the door, wherein when the door is moved from the closed position to the partway open position the spring means moves the arm into the forward releasing position, and wherein when the door is moved from the partway open position to the closed position the rod pulls the wire against the operation of the spring means to move the arm into the rearward restraining position.

4,451,062

AUTOMATIC LOCKING SAFETY BELT RETRACTION APPARATUS WITH RESETTING MEANS

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Aug. 20, 1981, Ser. No. 294,820
Int. Cl.³ B60R 21/10
U.S. Cl. 280—806 3 Claims



1. In a safety belt webbing emergency locking apparatus, for restraining a vehicle passenger in his seat, of the type having clamping means including one or more wedge shaped clamp members for clamping directly upon the webbing, biasing means for biasing said clamping means to a webbing clamping position preventing safety belt movement, releasable retaining means for normally holding said clamping means in a webbing release position against the bias of said biasing means and vehicle inertia sensor means for operating said releasable retaining means to release said clamping means to clamp said webbing preventing further movement thereof due to the bias of said biasing means, the improvement comprising the provision of:

reset means for resetting said retaining means to move said clamping means to said webbing release position and and hold it in said position against the bias of said biasing means in response to operation of another part of the vehicle, such as the vehicle door, by said vehicle passenger in predetermined manner.

4,451,063

RUNNING BOARD CONSTRUCTION

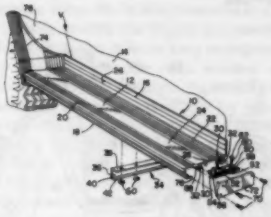
Steven A. Snyder, Constantine, Mich., assignor to Coachmen Industries, Inc., Middlebury, Ind.

Continuation-in-part of Ser. No. 348,507, Feb. 12, 1982. This application Jun. 9, 1982, Ser. No. 386,755
Int. Cl.³ B60R 3/00
U.S. Cl. 280—163 19 Claims

1. In a running board construction for mounting on a vehicle including an elongate deck, mounting means for substantially horizontally mounting said deck to the vehicle, said mounting means including at least one elongate bracket means for extending beneath and substantially transverse to the deck, said bracket means also being attachable to the frame of the vehicle, and fastener means for fastening said elongate bracket means to the underside of the deck, wherein the improvement in said fastener means comprises:

a channel mounted on the underside of said deck, said channel including a pair of walls substantially spaced transversely from and parallel to each other on said deck and extending downwardly from the underside of said deck, and a pair of inward turned lips on said walls extending toward each other;

a plate of substantial length in a direction transverse of said deck and extending between said walls transversely of said deck and slidably supported upon said lips, and



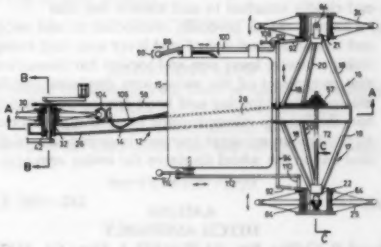
stud means extending downwardly from said slidable plate for attaching said plate to said bracket means and drawing said plate downwardly against said lips, the length of said plate being substantially greater than the transverse dimension of said stud means.

4,451,064

TRICYCLE

Robert D. Perkins, 41 Roxborough St. East, Toronto, Ontario, Canada M4W 1V5

Filed Jul. 12, 1982, Ser. No. 397,366
Int. Cl.³ B60K 5/04; B60M 3/00
U.S. Cl. 280—259 9 Claims



1. A tricycle comprising:

a frame having front and rear end portions and a rider support seat, a pair of laterally spaced rear wheels journalled for rotation in the rear end portion of the frame, rider operable steering mechanism for pivoting the rear wheels for steering the tricycle,

a single front wheel which has a central hub and which is mounted for free rotation on the front end portion of the frame, and

rider operable means for driving at least one of said rear wheels and comprising drive means journalled for rotation independently of the front wheel about a horizontal axis which is disposed through the hub of said front wheel, driven means, and connection means so operatively connecting the driven means to said at least one rear wheel that said at least one rear wheel may be rotated by said driven means while being pivoted for steering of the tricycle,

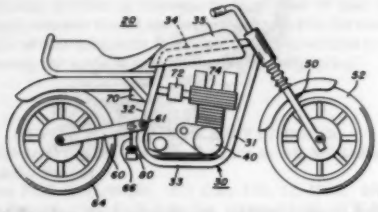
said drive means being provided with foot pedal cranks, and said drive and driven means being adapted to be engaged by a drive coupling for driving said driven means.

4,451,065

TORSION SUSPENSION SYSTEM FOR MOTORCYCLES

John E. Williams, Jr., Duquesne, Pa., assignor to AAKAC Industries, Inc., Apollo, Pa.

Filed Jun. 18, 1982, Ser. No. 389,664
Int. Cl.³ B62K *25/28*
U.S. Cl. 280—284 **21 Claims**



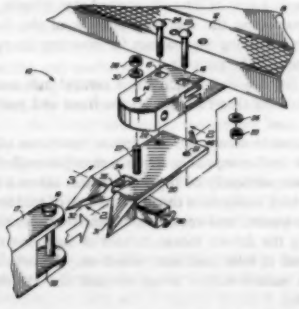
1. A suspension system suitable for motorcycles comprising:
(a) a frame and a motor;
(b) a swing arm, having a pivot point on one of the frame and the motor, comprises at least one arm supporting a wheel, the swing arm permitting the wheel to rotate about a generally horizontal axis and to move in a generally vertical direction with respect to the pivot point axis of said swing arm;
(c) a torsion bar suspension member having a first end portion and a second end portion and mounted at an angle with respect to the pivot point axis, the first end portion secured to one of said frame and said motor, and said second end portion being rotatably carried by one of said frame and said motor;
(d) a lever arm having a first end and a second end, the first end rigidly attached to said torsion bar; and
(e) a linkage means pivotally connected to said swing arm and to said second end of said lever arm, said swing arm, linkage means, lever arm and torsion bar connected such that movement of the swing arm displaces said linkage means thereby forcing said lever arm to twist said torsion bar, the linkage means and the lever arm connected so as to provide an apparent increase in spring rate of the torsion bar as the wheel displaces the swing arm.

4,451,066

HITCH ASSEMBLY

Edmond R. Collins, Rte. #1, Box 103-A, Pitts, Ga. 31072

Filed Aug. 16, 1982, Ser. No. 408,138
Int. Cl.³ B60D *1/02*
U.S. Cl. 280—508 **6 Claims**



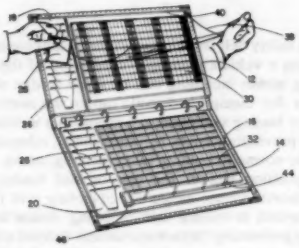
1. A hitch adaptor assembly to convert a manual hitch to an automatic hitch comprising in combination:
a frame having angled guides formed thereon to guide a trailer hitch pin on a trailer tongue into the hitch frame;
a frame attaching means including threaded members adapted to connect said frame to an existing hitch with a portion of said frame protruding in front of said existing hitch;
a spring loaded hitch locking bolt mounted to said frame spring biased to close behind a trailer hitch pin positioned in said frame;
a spring loaded catch bolt for holding said spring loaded hitch locking bolt in a cocked position, said spring loaded catch bolt being biased into the path of said locking bolt and in the path of a trailer pin being guided into said frame by said angled guides, whereby a manual trailer hitch can be easily converted to an automatic hitch.

4,451,067

COMPREHENSIVE, CENTRAL SCHEDULING FOLDER FOR PROJECT MANAGEMENT

Marvin E. Williams, 1318 Brairmeadow Dr., Worthington, Ohio 43085

Filed Jun. 1, 1982, Ser. No. 383,501
Int. Cl.³ B42D *3/18, 17/00*
U.S. Cl. 281—31 **6 Claims**

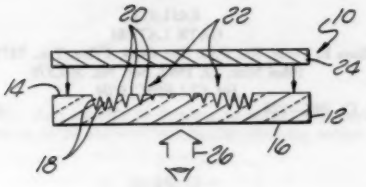


1. An improved management scheduling folder of the type having a front panel hingedly connected to a rear panel and having at least one intermediate panel hingedly connected intermediate the front and rear panels, wherein the improvement comprises the combination of:
(a) a plurality of project cards having selected, identical dimensions;
(b) a plurality of panel surfaces formed on said panels, each panel surface having a plurality of card-receiving pockets arranged in a column and spaced and aligned to position cards received in said pockets in overlapping arrangement to expose a portion of each received card, said exposed portion having a height equal to the spacing of said pockets; and
(c) a scheduling calendar mounted to each panel surface beside each column of pockets, each calendar having a chart portion having a plurality of parallel lines each extending laterally of said column of pockets and substantially aligned with an exposed edge of a different card positioned in said pockets such that information transcribed in each of said laterally extended lines of said calendar relates to the data of a single exposed project card which has said exposed edge aligned with that laterally extended line, each calendar also having a plurality of spaced lines substantially parallel to the longitudinal axis of said column of pockets to form columns of spaces intersected by said lateral lines, said columns of spaces being labelled with sequential time/calendar intervals.

4,451,068
ENGRAVED IMAGE IDENTIFICATION CARD WITH OPAQUE COVER LAYER

John S. Hall, and Barry C. Phelps, both of Sacramento, Calif., assignors to California Interface and Software Limited Partnership, Sacramento, Calif.

Filed Dec. 14, 1981, Ser. No. 330,348
Int. Cl.³ B42D 15/00
U.S. Cl. 283—75 7 Claims



1. A two-layer engraved identification card comprising:

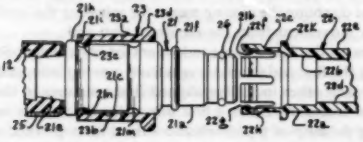
a translucent, single layer, planar member having a first major surface and a second major surface opposite the first major surface, the first major surface having an image engraved therein to define engraved regions and non engraved regions for generating an observed image on the translucent planar member the engraved regions being entirely contained in the translucent single layer planar member; and

a non-engraved opaque planar member abutting directly against and covering one of the first and second major surfaces for enhancing the contrast between the non-engraved and the engraved regions whereby the observed image is more readily seen, the other of the first and second major surfaces being completely uncovered.

4,451,069
QUICK CONNECT FLUID COUPLING

Robert R. Melone, Rockford, Ill., assignor to Smith Investment Company, Belvidere, Ill.

Filed Aug. 9, 1982, Ser. No. 406,721
Int. Cl.³ F16J 15/00; F16L 37/18
U.S. Cl. 285—86 7 Claims

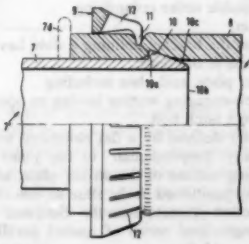


1. A quick connect fluid coupling for detachably connecting two parts on a common axis comprising, a male member adapted to form the termination of a first part and a female member adapted to form the termination of a second part, the female member having an intermediate portion defining an annular internal seal wall and a plurality of circumferentially spaced radially resilient fingers extending in cantilever fashion from the intermediate portion to the distal end of the female member, the male member having an annular intermediate portion dimensioned to be received inside the resilient fingers on the female member and an annular nose portion at the free end of the male member dimensioned for reception in the internal seal wall on the female member, annular seal means between the annular nose portion and the annular seal wall for sealing the interface therebetween, a first shoulder means on the outer side of the intermediate portion of the male member and a second shoulder means on the inner side of the fingers on the female member adjacent the free end thereof for engagement with the first shoulder means on the male member when the nose portion on the male member is positioned in the internal seal wall on the female member, a locking sleeve having a circumferentially continuous ring portion and a plurality of circumferentially spaced radially resilient fingers extending in cantilever fashion from the ring portion, the ring portion of the locking sleeve being dimensioned to surround the fingers on the female member when the locking sleeve is in a first locking position and radially confine the fingers at a position in which the second shoulder means is in locking engagement with the first shoulder means to lock the male member against axial withdrawal from the female member, the locking sleeve being slidably mounted on one of said members for movement from said first locking position to a second release position in which the ring portion is spaced axially from the free ends of the fingers on the female member, the fingers on the sleeve having third shoulder means on the inner side thereof adjacent their free ends, said one of said members having fourth shoulder means at a location thereon to engage the third shoulder means on the locking sleeve when the sleeve is in said first locking position thereof, said one of said members having a fifth shoulder means thereon at a location to engage said third shoulder means on the locking sleeve when the sleeve is in its said second release position thereof, said resilient fingers on the locking sleeve resiliently biasing the third shoulder means thereon radially inwardly into engagement with said fourth and fifth shoulder means when the locking sleeve is in said first locking position and said second release position respectively, the third shoulder means and the fourth shoulder means having cam surfaces shaped to cam the fingers in the sleeve outwardly when axial force is applied to the sleeve in a direction to move the sleeve from the first locking position to the second release position and the third shoulder means and the fifth shoulder means having cam surfaces shaped to cam the fingers on the sleeve outwardly when axial force is applied to the sleeve in a direction to move the sleeve from the second release position to the first locking position.

4,451,070
HOSE COUPLING

Heinz Sauer, Roaneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,186
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010425
Int. Cl.³ F16L 33/22
U.S. Cl. 285—242 32 Claims



1. A hose coupling comprising:

(a) a pipe having a first end portion provided with an end face and an external, circumferentially extending, ring-shaped collar;

(b) a hose fabricated from a material which can be permanently deformed upon the application of heat and pressure, said hose having a second end portion which surrounds said first end portion, the outer diameter of said second end portion in undeformed condition thereof exceeding the outer diameter of said collar and the inner diameter of said second end portion in undeformed condi-

tion thereof being less than the outer diameter of said collar and less than the outer diameter of said first end portion; and

(c) a one-piece, ring-shaped clamping device having one internal, ring-shaped bead, the length of said one bead being substantially less than the length of said clamping device, and the inner diameter of said clamping device at said one bead exceeding the outer diameter of said collar and being less than the outer diameter of said second end portion in undeformed condition of the latter, the wall thickness of said second end portion in undeformed condition thereof exceeding half the difference between the inner diameter of the clamping device at said one bead and the outer diameter of said collar, and said clamping device being designed to be mounted on said second end portion before the latter surrounds said first end portion and to be passed over said collar together with said second end portion by relative axial movement of said end portions to thereby generate a compressive force for urging said second end portion against said first end portion, said one bead surrounding and bearing against said second end portion on the side of said collar remote from said end face, and said clamping device independently holding said second end portion in engagement with said first end portion.

4,451,071

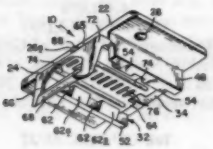
ADJUSTABLE STRIKE

Jim G. Striese, Brockton, Mass.; John E. Iafret, and William D. Batterson, both of Grand Blanc, Mich., assignors to TRW Inc., Cleveland, Ohio and General Motors Corporation, Detroit, Mich.

Filed Dec. 28, 1981, Ser. No. 334,786

Int. Cl.³ E05B *15/02*

U.S. Cl. 292—341.18 **23 Claims**



1. An adjustable strike comprising

A. a bracket,

B. means on the bracket defining a slide having a floor,

(1) a recess in the floor,

C. A striker plate, said plate including

(1) a latch-engaging section having an opening adaped to receive a latch bolt,

(2) a slider defined by a flat elongated tongue extending generally perpendicular to the plane of the latch-engaging section of the striker plate, said slider being slidably positioned in the slide so that the latch-engaging section projects from the slide, and

(3) a longitudinal series of spaced parallel slots in the tongue, said slots

(a) being oriented at an acute angle to the longitudinal axis of the tongue for receiving screw convolutions extending out of said bracket recess,

D. an adjusting screw rotatively mounted in the recess, said screw having

(1) an elongated rod-like member

(2) a screw thread disposed along the rod-like member threadedly engaging the slider, said screw thread being composed of helical convolutions which project out appreciably from the surface of the member and extend out of said recess into threaded engagement with the slots in said tongue, and

(3) a head accessible at an edge of the bracket adjacent the latch-engaging section for turning the screw in one direction or the other to move the striker plate in one direction or the other along the slide, and

E. means at opposite sides of the slide for retaining the slider in the slide.

4,451,072

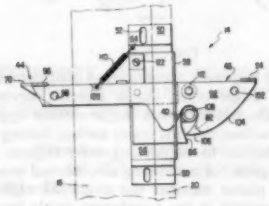
GATE LATCH

William E. Petty, Sr., P.O. Box 6464, Tyler, Tex. 75711

Filed Mar. 22, 1982, Ser. No. 360,578

Int. Cl.³ E05C *3/04*

U.S. Cl. 292—128 **9 Claims**



1. A latch for a fence gate of the type pivoted between a pair of spaced posts for movement about a vertical axis and having a latch post carried thereon, comprising

a bracket for attachment to one of the fence posts;

a first lever pivoted to the bracket and having a reentrant slot for receiving the latch post in a latched position of the latch;

means carried by the bracket for closing the reentrant slot of the lever in the latched position of the latch for locking the latch post in the reentrant slot, the closing means comprising a second lever pivoted for movement relative to the first lever and including means for closing the reentrant slot of the first lever in the latched position of the latch for locking the latch post in the reentrant slot;

means in opposite ends of the second lever for manipulating and disabling the closing means for releasing the latch post for movement from the reentrant slot; and

means on the first and second levers for selectively preventing the first and second levers from moving independently of each other including aligned first apertures in the first and second levers on a first side of the bracket for receiving the hasp of a padlock and a third lever pivoted to the bracket and providing an aperture aligned with the first apertures.

4,451,073

FLEXIBLE CORE FOR TOOL HANDLES

Joseph A. Carmien, 525 Maple Ave., Beverly Hills, Calif.

Filed Aug. 13, 1982, Ser. No. 407,819

Int. Cl.³ A01B *1/22*; B25G *3/24*

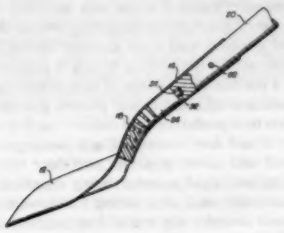
U.S. Cl. 294—57 **5 Claims**

1. A flexible core for insertion into a handle receiving socket of a hand tool, said core comprising:

an elongated, generally cylindrical body;

a plurality of grooves formed in said body and spaced from one another along said body, forming at least one socket

filler for bearing compressive load in said handle receiving socket; and



a flexible shaft capable of bending to permit said core to conform to the shape of said handle receiving socket.

4,451,074

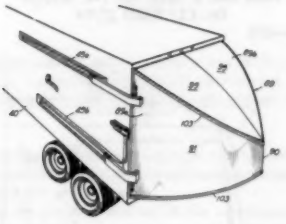
VEHICULAR AIRFOILS

Barry Scanlon, 939 Cumberland Rd., NE., Atlanta, Ga. 30306

Filed Nov. 9, 1981, Ser. No. 319,628

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **7 Claims**



1. An airfoil to lessen wind resistance in truck bodies and the like comprising a collapsible and erectable airfoil consisting of two companion airfoil sections each having folding panels and an attached internal folding support frame, supporting guide rail means for each airfoil section on the two side walls of a truck body equipped with the airfoil including a pivoted strut, at least one panel of each airfoil section having a locking element thereon, a coacting locking element receiver on the adjacent end wall of the truck body, said supporting guide rail means comprising at least a fixed horizontal guide rail on each side of the truck body, a carriage movably engaging the guide rail and connected with the pivoted strut, a spring buffering means for the carriage on the fixed guide rail and serving to apply continuous pressure to said locking element when the latter is engaged in said receiver to prevent the escape of the locking element therefrom.

4,451,075

REMOVABLE STORAGE COVER FOR TRUCK BEDS

Henry A. Canfield, 12000 Saw Mill Rd., #307, The Woodlands, Tex. 77308

Filed Jul. 30, 1982, Ser. No. 403,852

Int. Cl.³ B60R *11/00*

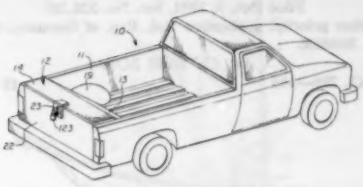
U.S. Cl. 296—37.6 **14 Claims**

1. In combination with a pickup truck, a removable storage cover for the bed of said truck comprising;

a first rigid panel member positioned horizontally from side to side across the rear end portion of said truck bed, adjacent to the tailgate and supported on the side walls of said bed,

a second rigid panel member positioned from side to side across the rear end portion of said truck bed, adjacent to said first rigid panel member and releasably attached in a fixed position to the side walls of said bed, extending angularly downward from the edge of said first panel member to the bed of said truck to provide a surface of low aerodynamic resistance,

a hinge securing together the rear edge of said first panel member and the upper edge of said second panel member,



said first and second panel members and the tailgate of said truck forming a secure enclosure, and

said enclosure being accessible either by opening said tailgate or said second panel member.

4,451,076

OUTER SUPPORT BRACKET FOR AUTOMOBILE SUN VISORS

Lothar Viertel, Saarlouis, and Peter Kaiser, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,552

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113625

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 K **22 Claims**

1. An outer support bracket for receiving and supporting and being separable from an outer support shaft of a vehicle sun visor, wherein the outer support shaft and the outer support bracket are spaced from a swivel bearing for the sun visor; the bracket comprising a base part for being fastened on the body of a vehicle and a head part separate from and swingably mounted on the base part;

the head part having a support opening in it shaped and oriented for receiving in it the outer support shaft of a sun visor and for the outer support shaft in the support opening to extend across the head part, and a slot in the head part for providing access into the support opening for the outer support shaft of a sun visor as the sun visor is swiveled around its swivel bearing for selectively swinging the outer support shaft into and out of the support opening; and

the head part being swingable with respect to the base part for orienting the support opening for separably receiving and supporting the outer support shaft of a sun visor.

4,451,077
STRUCTURALLY REINFORCED MOTOR VEHICLE BODIES

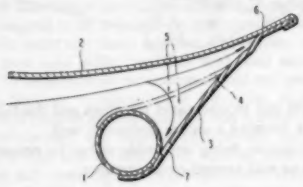
Ulrich Bruhnke, Ehningen; Bernd Christoph, Sindelfingen; Bernd Harloff, Böblingen, and Hans Krakat, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,265

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046056

Int. Cl.³ B60R *21/04*

U.S. Cl. 296—185 **15 Claims**



1. An automotive vehicle structural part having an outer covering, pipe means for reinforcing at least a portion of the structural part, a plurality of retaining clip means connected with an edge area of the outer covering for mounting the pipe means along at least a portion of at least one edge of the outer covering at a distance from the outer covering and the at least one edge, said retaining clip means and outer covering define a wedge-shaped space tapered in a direction of the at least one edge, wherein a space defined between the pipe means and the outer covering has a size sufficient to permit a free passage of a spary jet aimed thereat.

4,451,078
VEHICLE SEAT ASSEMBLY HAVING A DOOR STOPPER

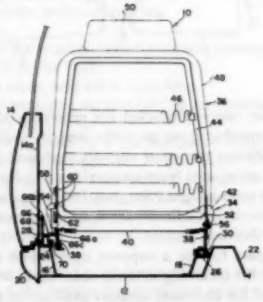
Kouzo Maeda, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 290,073

Claims priority, application Japan, Aug. 14, 1980, 55-115601[U]

Int. Cl.³ B60J *5/04*; B60R *21/02*

U.S. Cl. 296—188 **16 Claims**



1. A vehicle comprising:

a chassis having a passenger compartment with a floor and a door which can be moved between an open position and a closed position;

a seat assembly located near said door in said passenger compartment;

a sliding mechanism mounted on said floor of said vehicle and supporting said seat assembly for permitting sliding movement of said seat assembly in a fore-and-aft direction relative to said floor; and

a rigid member secured to said seat assembly to move therewith, said rigid member extending toward the door in said closed position, said rigid member having a leading end portion with a flat section which is substantially parallel with a portion of a surface of said closed door and which is positioned adjacent to said portion and spaced from said portion by a predetermined distance such that upon movement of said door inward of said passenger compartment beyond said closed position, said door contacts said flat section, said rigid member being attached between said seat assembly and said sliding mechanism for mounting said seat assembly on said sliding mechanism,

whereby during a collision, when said door is pushed into said passenger compartment by an external force applied thereto, said door is brought into engagement with said flat section of said rigid member thereby either preventing further inward motion of said door or moving said seat assembly in response to movement of said door.

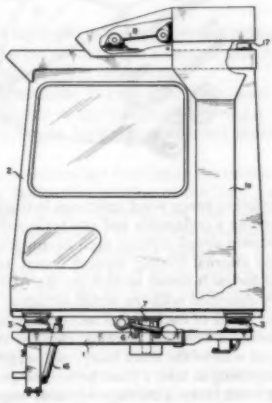
4,451,079
OPERATOR'S CAB IN A CONSTRUCTION VEHICLE

Tomoyuki Takahashi, Yawata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 3, 1981, Ser. No. 269,958

Int. Cl.³ B62D *27/04*

U.S. Cl. 296—190 **4 Claims**



1. An operator's cab in a construction vehicle having a chassis frame comprising:

a body of the operator's cab having a bottom, a center of gravity, a location on the bottom horizontally corresponding to the center of gravity, and four diagonally opposed corners on the bottom;

air spring means provided between the bottom of the body and the chassis frame at each of the four corners for supporting the body on the frame in a cushioning manner;

two first coupler levers longitudinally connected between the bottom of the body and the frame restricting oscillation of the body in the longitudinal direction thereof;

a single second coupler lever transversely directly connected between a position near the location on the bottom of the body corresponding to the center of gravity and the frame restricting oscillation of the body in the transverse direction thereof; and

damper means substantially vertically connected between the bottom of the body at two of the corners and the frame for damping and restricting vertical oscillation of the body;

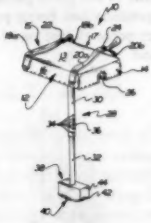
both ends of each of the first coupler levers and the second coupler lever being respectively connected through annular resilient members with connecting shafts which are disposed perpendicularly to the coupler lever and one of which is fixedly secured through a bracket to the frame and the other of which is fixedly secured through a bracket to the body, thereby absorbing oscillations of the body into the annular resilient members.

4,451,080

MOBILITY AID

Ceoma Nix, 9602 Empire Ave., Cleveland, Ohio 44108

Filed Feb. 27, 1981, Ser. No. 238,993
Int. Cl.³ A47C 1/00; A45B 1/00
U.S. Cl. 297—4 **12 Claims**



1. A mobility aid for use, in conjunction with crutches or other movable supports, for step-like movement by legless persons and persons lacking supporting use of their leg or legs, comprising:

a seat;

retaining means for securing a person in said seat;

leg means attached at one end to said seat for supporting said seat above the ground; and

foot means for rocking said aid at the commencement and conclusion of each step, said foot means being secured to an end of said leg means opposite the end attached to said seat, said foot means having a ground-engaging convex surface opposing said leg means, the convexity of said surface extending along the dimension of said foot lying in the direction of movement.

4,451,081

HEADREST FOR A RECLINING CHAIR

Jerome R. Kowalski, Tupelo, Miss., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Jan. 6, 1982, Ser. No. 337,465
Int. Cl.³ A47C 1/02
U.S. Cl. 297—61 **20 Claims**

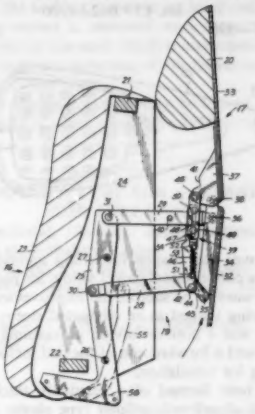
1. A headrest arrangement for use on a backrest of a chair, particularly of a reclining chair, comprising

a support including a first and a second support member articulately connected to one another for angular displacement relative to each other about an axis disposed therebetween;

a cushion member secured at least to said first support member and projecting in a predetermined direction therefrom;

means for so mounting said support on the backrest that said first support member is situated upwardly of said second support member and said axis extends substantially horizontally for movement between a retracted position in which said support and cushion members are situated in the back of the backrest and an extended position in which at least said first support member extends upwardly of the backrest and said cushion member projects frontwardly above the backrest and beyond the same, said mounting means including at least one kinematic linkage mounting said second support member on the backrest;

means for angularly displacing said first support member relative to said second support member during the movement of said support relative to the backrest between said retracted and extended positions thereof, said angularly displacing means including at least one connecting link



articulated to said kinematic linkage and to said first support member; and

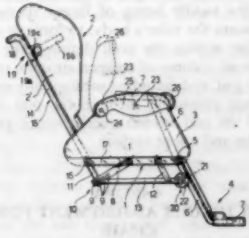
means for changing the effective length of said connecting link.

4,451,082

SEAT FOR A BABY'S PUSH CHAIR

Pietro Giordani, Via Cavallina, 4, 40100 Bologna, Italy

Filed Jul. 17, 1981, Ser. No. 284,493
Claims priority, application Italy, Aug. 1, 1980, 53452/80[U]
Int. Cl.³ A47C 1/02
U.S. Cl. 297—90 **8 Claims**



1. In a push chair, a seat comprising a support, a seat back, and a foot rest, said seat back and said foot rest being adjustable in inclination with respect to said support, and an articulated quadrilateral mechanism operatively connected between said foot rest and said seat back, said mechanism including a shaft and a link rod, said link rod rigid with said seat back and extending between said shaft and said support, said shaft having one end disposed towards said foot rest, said foot rest including at least one strut pivotally connected to said support, and guide means mounted to said shaft one end and including means to partially embrace opposite sides of said strut and to cooperate therewith in a slidable manner so that inclination of said seat back enables suitable inclination of said foot rest with respect to said support.

4,451,083

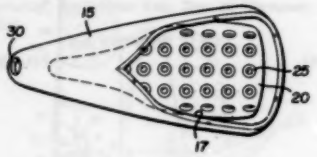
BICYCLE SADDLE COVER PAD

John L. Marchello, Traverse City, Mich., assignor to Danmar Products, Inc., Ann Arbor, Mich.

Filed Apr. 23, 1982, Ser. No. 371,061

Int. Cl.³ B62J 1/00

U.S. Cl. 297—195 **1 Claim**



1. In a cover pad shaped for fitting uponand substantially enveloping a conventional bicycl saddle for padding the upper surface and sides of he saddle, the improvement comprising:

said pa being shaped as an elongated sleeve with an upper surface and a bottom having an opening to receive sad saddle, and a forward end of the pad including a enlarged opening for ventilation;

said pad bein formed of a relatively thick, substantially resilient, closed cell, cellular type plastic material which rapidly compresses and less rapidly recovers its shape for thereby absorbing substantial portions of shock forces resulting from road jolts and impacts, which otherwise would be transmitted from the saddle directly to the rider, and with the pad normally providing a comfortable relatively resilient support surface upon the saddle;

numerous openings extend through the pad for normally providing air passages between the saddle and the rider for ventilation, but with such openings having their opposite open ends sealable respectively by tight surface contact with the rider's body and the adjacent saddle surfaces when the pad is momentarily compressed to trap air within the compressing openings to provide an air spring effect for absorbing shock forces;

said pad being cross-sectionally considerably thicker in its portions which overlay the major portions of the upper surfaces of the bicycle saddle, and with the openings that extend through the thicker portion of the pad being formed of two coaxial cylindrical shapes, with the shape adjacent the saddle being of larger diameter than the shape adjacent the rider's body, to form an internal annular shoulder within the wall defining the opening, for forming an air column of trapped air upon rapid compression of the pad, and including substantially uniform diameter openings extending through the pad in the thinner regions of the pad, which overlie minor portions of the saddle sides and upper surface.

4,451,084

BACKREST HEIGHT ADJUSTMENT FOR OFFICE CHAIR

Wayne C. Seeley, York, Pa., assignor to Simmons Universal Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,280

Int. Cl.³ A47C 7/46

U.S. Cl. 297—353 **11 Claims**

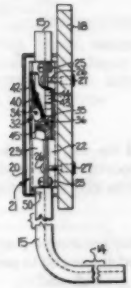
1. In an office chair including a seat, a vertically extending support member having its lower end secured to said seat, and a backrest supported for vertical adjustment on the upper end portion of said support member, the combination therewith of improved means for adjusting the vertical position of said backrest on said support member, said backrest adjusting means comprising

a. a housing fixed on said backrest and supporting said backrest for vertical sliding movement on the upper portion of said support member,

b. notch means extending vertically along the upper portion of said support member and including upper and lower ends,

c. a pawl pivotally supported on said housing and including ratchet finger means positioned below the pivot point of said pawl, said pawl being movable between an operative position with said ratchet finger means in engagement with said notch means, and an inoperative position with said ratchet finger means out of engagement with said notch means,

d. an elongate tension spring with a longitudinal axis and including upper and lower ends, said lower end of said tension spring being connected to said pawl below the pivot point thereof and adjacent said ratchet finger means, said upper end of said tension spring being connected to said housing and above the pivot point of said pawl, and said longitudinal axis of said tension spring being positioned on one side of the pivot point of said pawl when in said operative position and being positioned on the other side of the pivot point of said pawl when in said inoperative position, and



e. operator means associated with said upper and lower ends of said notch means for engagement with said pawl, said operator means at the lower end of said notch means being operable to move said pawl into said operative position and maintained in said operative position by said spring axis being positioned on one side of the pawl pivot point when said backrest and said pawl are moved to the lower end of said notch means so that said backrest may be moved to the desired level and maintained in such adjusted position by engagement of said ratchet finger means with said notch means, said operator means at the upper end of said notch means being operable to move said pawl into said inoperative position and maintained in said inoperative position by said spring axis being positioned on the other side of the pawl pivot point when said backrest and said pawl have been moved to the upper end of said notch means so that said backrest may be freely moved to said lower end of said notch means in preparation for making a subsequent vertical adjustment of said backrest.

4,451,085

CHAIR

Klaus Franck, Hanover, and Werner Sauer, Wennigsen, both of Fed. Rep. of Germany, assignors to Wilkhahn & Hahne GmbH & Company, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,679

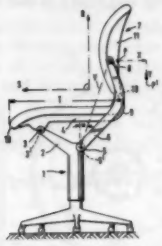
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3036993

Int. Cl.³ A47C 3/00

U.S. Cl. 297—285 **32 Claims**

1. A reclinable article of sitting furniture comprising a support means for supporting the article, a seat portion, a back portion, means for mounting a forward area of the seat portion on the support means, and lever means for mounting the back

portion on the support means, the lever means has a first end articulated to the back portion and a second end articulated to the support means, characterized in that an arcuate flexible intermediate means is interposed between the seat portion and the back portion connecting the seat and back portions together, the flexible intermediate means is adapted to be flexed such that the arc becomes wider when the intermediate means is flexed, the first end of the lever means is articulated to the



back portion at approximately hip level of a user of the article, the second end of the lever means is articulated to the support means at a point below and approximately at a center of the seat portion, and in that a line connecting the points of articulation of the lever means to the back portion and support means subtends, with respect to a vertical plane, a predetermined angle in the range of between 0° and 25° when the article is in a basic upright position.

4,451,086

SEAT FOR A CHAIR FOR PERSONS HAVING HIP AND/OR LEG STIFFNESS

Regnell Seven, Vastervik, Sweden, assignor to Mercado Rehabilitering AB, Stockholm, Sweden

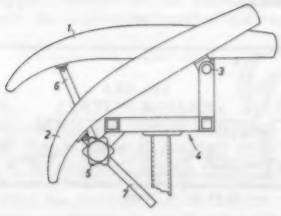
PCT No. PCT/SE80/00195, 371 Date Mar. 25, 1981, 102(e) Date Mar. 25, 1981, PCT Pub. No. WO81/00350, PCT Pub. Date Feb. 19, 1981

PCT Filed Jul. 29, 1980, Ser. No. 247,305

Claims priority, application Sweden, Aug. 1, 1979, 7906532

Int. Cl.³ A47C *1/00, 7/02*

U.S. Cl. 297—312 **1 Claim**



1. Seat for a chair for persons having hip and/or leg stiffness, said seat including at least two pivotable portions pivoting around a pivot axis extending in the lateral direction of the seat, the forward edge of each pivotable portion forming part of the front edge of the seat, whereby each pivotable portion is arranged for pivoting movement between a substantially horizontal position and a position where it is directed forwardly and downwardly, a locking device being arranged for locking each pivotable portion in the desired position, characterized in that:

each pivotable portion extends over substantially the full sitting depth of the seat,

the pivot axis is positioned at a distance from the front edge of the seat corresponding to approximately three-fourths of the sitting depth,

each pivotable portion in its front portion is supported by a support means, which is pivotally connected to the pivotable portion at one end and is arranged to slidingly cooperate with the locking device at its other end, and

each locking device is mounted on a frame, which also carries the pivot axis and which is provided with mounting means enabling mounting of the frame on the base of any standard type chair,

wherein each pivotable portion may be locked or unlocked independently of other pivotable portions.

4,451,087

ANCHORING STRUCTURE FOR A SELF-STANDING SEAT BELT UNIT

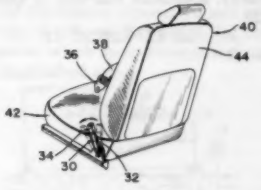
Masahiro Tamamushi, Machida, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 15, 1981, Ser. No. 283,687

Claims priority, application Japan, Aug. 15, 1980, 55-116292[U]

Int. Cl.³ A47D *15/00*; B60R *21/00*

U.S. Cl. 297—468 **6 Claims**



1. An anchoring structure for a self-standing seat belt unit adapted to be anchored to a side portion of a vehicle seat, said seat belt unit including a self-supporting, elongated upstanding member formed at the lower end portion thereof with a bolt accomodation hole and a belt connector mounted to the upper end of said upstanding member, said anchoring structure comprising:

a support member mounted to the side portion of said vehicle seat and having a bolt accommodation hole with which said bolt accomodation hole of said upstanding member is aligned;

a bushing member having a sleeve portion and a flange portion, said sleeve portion being received within said bolt accomodation hole of said upstanding member, said flange portion being interposed between said upstanding member and said support member;

a bolt passing through said bolt accomodation holes and said bushing sleeve portion and attaching the lower end of said upstanding member to said support member in such a manner that the upstanding member is swingingly movable about the axis of said bolt, said bolt having a head portion, a threaded stem portion and a nut at the end of said stem;

biasing means constituted by a relatively thin elastic member mounted on said bolt for urging the lower end portion of said upstanding member against said support member for thereby retaining, by the effect of frictional resistance, said upstanding member at a convenient position for use, said biasing means cooperating with said head portion of said bolt and said nut to elastically clamp the lower end portion of said upstanding member toward said support member; and

a guide member of a thin-walled structure, mounted on the lower end portion of said upstanding member to rotate together therewith about the axis of said bolt and having a channel-like portion including a base wall and a pair of side walls, said base wall interposed between the lower

end portion of said upstanding member and said flange portion of said bushing member and being formed with a hole which is substantially aligned with said bolt accomodation hole of said upstanding member and through which said sleeve portion of said bushing member passes, said side walls being adapted to fittingly receive between them the lower end portion of said upstanding member, said guide member further comprising an integral finger portion provided at the lower end of said base wall and projecting toward said support member;

said support member having an elongated opening to receive therewithin said finger portion in such a manner that the finger portion is movable within said opening and abuttingly engageable with the end walls of said opening to limit the extent of swinging movement of said upstanding member.

4,451,088

GAINING ACCESS TO VERY DEEP COAL SEAMS BY CARRYING EXPLOSIVE IN DENSITY CONTROLLED FLUID

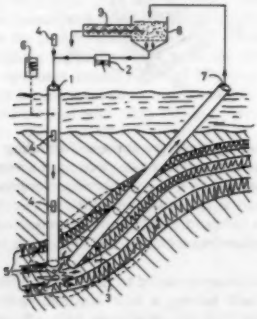
Karl Wisseroth, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,200

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108425

Int. Cl.³ E21C *37/12*

U.S. Cl. 299—11 **10 Claims**



1. In an improved process for gaining access to the coal of very deep seams, and for extracting same by causing liquid to flow through a cavern in the seams, via at least one borehole, and conveying to the surface a mixture of mechanically detached coal and liquid produced in the seams during this process, wherein the improvement comprises: filling the borehole and cavern with a liquid having a density no lower than that of the coal, but lower than that of the accompanying rock, carrying an explosive and means for its detonation in the liquid toward a coal face in the seams through which liquid is flowing, detonating said explosives at the coal face to break up and detach coal and rock whereby the pieces of coal detached from the seams during blasting are conveyed to the surface by said liquid and pieces of rock which have been detached at the same time remain in the cavern.

4,451,089

COAL-MINING MACHINE

Friedrich W. Paurat, Kasselweg 29, and Roland Paurat, Blumenstr. 11, both of 4230 Wesel, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 334,068

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048939

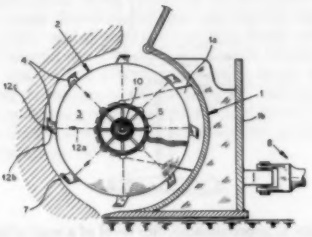
Int. Cl.³ E21C *35/22*

U.S. Cl. 299—43 **5 Claims**

1. In a broad-face coal-mining machine comprising a multiplicity of auger sections articulated to one another in an end-to-end relationship and provided with respective guide aprons whereby said auger sections are successively inclined relative to an adjoining auger section for excavation of coal from a tunnel front and rotation of said auger sections carries excavated coal along said aprons to remove the same, the improvement which comprises in combination:

nozzles on said auger sections for dispensing a liquid capable of wetting dust and preventing sparking;

a pipe for supplying said liquid to said auger sections;



valve means between said pipe and the nozzles of the auger sections responsive to the inclination thereof for feeding said liquid to the nozzles of an inclined auger section and limiting flow to a non-inclined auger section; and

actuating means operatively connected to said valve means and responsive to the degree of inclination of an auger section relative to an adjoining auger section whereby said valve means is opened upon sufficient inclination and is closed with insufficient inclination.

4,451,090

ADVANCING APPARATUS FOR COAL-MINING MACHINE IN UNDERGROUND MINE

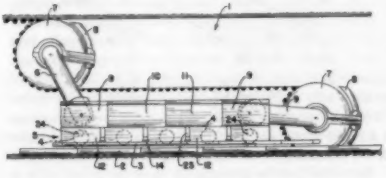
Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,151

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116457

Int. Cl.³ E21C *29/22*

U.S. Cl. 299—43 **8 Claims**



1. An apparatus for advancing a coal-mining machine along a machine track in an underground mine, said apparatus including the combination of rack means having rack teeth to engage with a drive wheel of each of a plurality of advancing means which are separate parts of said coal-mining machine, each of said advancing means including a hydraulic motor with fluid lines extending to a fluid pump means for rotating the drive wheel thereof, each of said advancing means further including a separate carriage bearing and moving on said rack means by a runner to partly engage around the profile of said rack means to insure engagement with the teeth of the drive wheel, at least one of said advancing means being disposed between runners situated on the same side of the coal-mining machine, means for connecting said runners to the body of said coal-mining

machine, means for connecting said at least one advancing means to bear only on the runners situated in front thereof in the direction of travel by said coal-mining machine along said machine track, and plate means for interconnecting the runners of each advancing unit, said plate means pointing in the direction of machine travel for enclosing and holding a drive wheel between them, said plate means also enclosing and holding between them the hydraulic motor for said advancing means.

4,451,091

TRACK FOR A LONGWALL MINING MACHINE

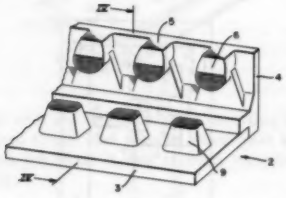
Herbert Schupphaus, Bochum, and Volker Knorr, Sprockhovel, both of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,376

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141162

Int. Cl.³ E21C *29/02*

U.S. Cl. 299—43 **9 Claims**



1. A track and gear rack disposed on one side of a face conveyor for a longwall mining machine and adapted to be engaged by a driving gear and guide means on the mining machine, said track and gear rack being of generally L-shaped cross-sectional configuration and having a vertical arm secured to the face wall of the conveyor, driving pin extensions extending outwardly from said vertical arm in cantilever beam relationship near the upper edge of said vertical arm and having vertical widths less than the height of the vertical arm, said L-shaped track and gear rack having a horizontal arm extending beneath said driving pin extensions, one of said arms being provided with spaced studs which engage guide block means on the mining machine for guiding it along said track, said studs lying in common planes of symmetry with at least some of said driving pin extensions, and said common planes extending transverse to the longitudinal length of said track and gear rack.

4,451,092

CUTTING ROLLER

Gerd Best, Sprockhövel, and Norbert B. Weikert, Dortmund, both of Fed. Rep. of Germany, assignors to Krampe & Co Fertigung in Bergbaubedarf GmbH, Hamm, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,725

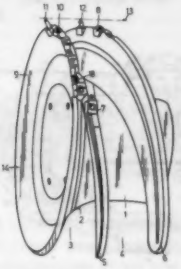
Claims priority, application United Kingdom, May 26, 1981, 8116046

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.³ E21C *25/10*

U.S. Cl. 299—81 **11 Claims**

1. A cutting roller for a mining machine, comprising a substantially conical member arranged to face the workings; a tubular body member having a central longitudinal axis and an end nearer the workings and a discharge end; at least one cutting blade on said working member; at least one cutting blade on said tubular member, each of said blades being provided with a plurality of bit holders carrying cutter bits, said body member having an outer surface extending over the entire length of the body member towards said closure member in such a smooth and even curve that the outer diameter of the body member in the region of the end nearer the workings is substantially greater than in the region of the discharge end; and means on the cutting roller for distribution liquid for damping dust produced during the mining, said means being connected to a suitable source of spraying liquid, said liquid



distribution means including a single liquid distribution ring channel arranged in the region of said closure member and a number of liquid distribution channels on said cutting blades connected thereto, said liquid distribution ring channel being formed by a groove which opens towards and extends coaxially with said longitudinal axis.

4,451,093

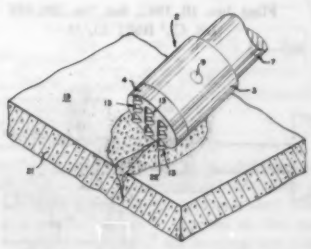
TOOL FOR SCARIFYING CONCRETE

Robert Perez, 447 Greenwood Dr., Santa Clara, Calif. 95050

Continuation of Ser. No. 215,055, Dec. 10, 1980, abandoned. This application Mar. 7, 1983, Ser. No. 472,630

Int. Cl.³ E21C *35/18*; E21B *10/58*

U.S. Cl. 299—88 **8 Claims**



1. A tool for scarifying concrete comprising:

(a) a main body having a working face thereof defined by an outer periphery and adapted to face in the direction of a concrete surface requiring scarifying; and

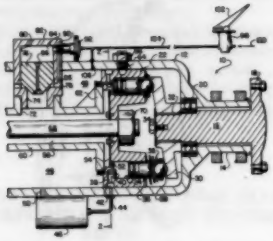
(b) a plurality of elongated carbide tips symmetrical about a longitudinal axis and embedded and brazed in said main body and having free end portions projecting from the working face thereof, said free end portions terminating in flat end faces angularly disposed to said longitudinal axis, each of said carbide tips embedded in said body at an angle to said working face whereby said free end portions lie within the outer periphery of said working face.

4,451,094

HYDRAULIC TRAILER BRAKE

Jose L. Martin, Farallon No. 60, Playas de Tijuana, Seccion Costa de Oro, Tijuana, B.C., Mexico

Filed Nov. 5, 1981, Ser. No. 318,317
Int. Cl.³ B60T *13/16*
U.S. Cl. 303—10 **7 Claims**



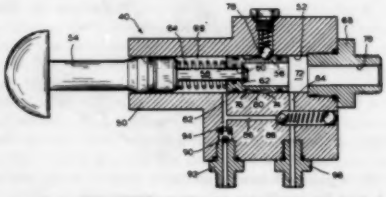
1. A fluid brake system for braking the wheels of a vehicle, said brakes comprising:
- a housing,
- a rotary shaft mounted in said housing and having an end thereof extending from said housing for mounting and supporting a wheel,
- an axial piston wobble plate incompressible fluid pump mounted in said housing and driven by said rotary shaft, said pump having a fluid inlet and a fluid outlet,
- circuit means including said inlet and outlet, and reservoir means defining a closed loop circuit, and
- selectively controllable restricting means;
- an air pressure responsive check valve,
- a source of air pressure, and
- control means for selectively controlling air pressure on said check valve for selectively controlling the resistance of said fluid in said circuit.

4,451,095

AUXILIARY RELEASE DEVICE FOR A HYDRAULIC PRESSURE RELEASABLE BRAKE

Willard L. Chichester, and Dean E. Davis, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 10, 1982, Ser. No. 386,855
Int. Cl.³ B60T *15/16*
U.S. Cl. 303—71 **9 Claims**



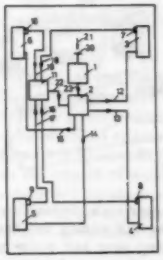
1. A normally activated hydraulic pressure releasable brake having a primary hydraulic pressure source, an auxiliary hydraulic pressure souce, and a valve means responsive to said primary source and to said auxiliary source operatively connected to said brake for allowing said auxiliary source to release the brake and simultaneously disconnect said primary source from the brake when the primary source is not delivering pressure to the valve means and for disconnecting the auxiliary source from the brake and allowing the primary source to release the brake when the primary source is delivering pressure to the valve means and the auxiliary source is not delivering pressure thereto, said valve means comprising a two-position spool valve responsive to said primary source on one side thereof and to said auxiliary source on the opposite side thereof, a manually acuatable pumping element operatively connected to the spool valve on one side thereof to generate said auxiliary source pressure when the primary source is not delivering pressure to the opposite side of said spool valve, and detent means for locating said spool valve in the first position in which primary source pressure is delivered to said brake and in a second position wherein auxiliary source pressure is delivered to said brake.

4,451,096

BRAKE SYSTEM ANTILOCKING MECHANISM

Johannes Gygax, Benken, Switzerland, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,137
Claims priority, application Switzerland, Nov. 11, 1980, 8348/80
Int. Cl.³ B60T *8/10*
U.S. Cl. 303—109 **5 Claims**



1. A vehicle brake system antilocking mechanism of the type having at least one modulator regulating the braking pressure in dependence on wheel retardation and having wheel sensors, wherein there are fewer modulators than wheels or sensors, and wherein the braking pressure to at least one group of wheels is regulated according to the "select-low" principle, comprising in combination:
- means for identifying the wheel which has been retarded most strongly;
- control means responsive to the identifying means for selecting the wheel or wheels in said one group of wheels in accordance with said "select-low" principle and as a function of the position and to the exclusion of the wheel retarded most strongly; and,
- means responsive to said control means for regulating braking pressure in accordance with the selection made by said control means.

4,451,097

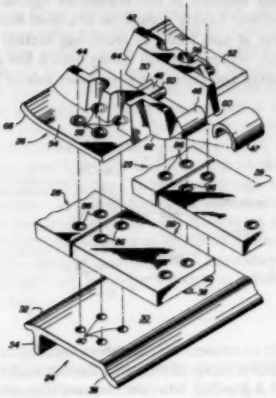
TRACK SECTION INCLUDING FLEXORS

William P. Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 1, 1982, Ser. No. 344,672
Int. Cl.³ B62D *55/24, 55/28*
U.S. Cl. 305—40 **19 Claims**

1. A track section adapted for interconnection with a plurality of like sections to form an endless drive track for a track-laying vehicle, comprising: at least one flexor; said flexor including at least two superposed, generally rectangular, resilient plates, which constitute a radially inner plate and a radially outer plate relative to the flexor being flexed for travelling about a drive sprocket; a track link; a grouser; said link and grouser having first and second flat surfaces, respectively, opposed to each other and having an end portion of said flexor located therebetween, a first pair of side-by-side mounting holes extending through said link, flexor and grouser; a first

pair of fastener means respectively received in said pair of mounting holes and respectively including a pair of bolts; said inner plate having a tight connection with said pair of bolts; and said outer plate having a clearance connection with said



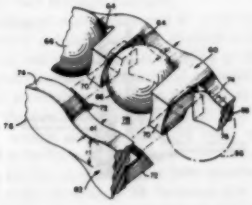
pair of bolts with the clearance being such that both plates carry a desired tensile load without either plate being overstressed when the flexor is bent as when travelling about a drive sprocket.

4,451,098

BALL SEPARATOR ASSEMBLY

Wilbur H. Farley, Beverly; Alfred J. Kotek, Ipswich, and John H. Carlson, Danvers, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Aug. 26, 1982, Ser. No. 411,826
Int. Cl.³ F10C *33/38*
U.S. Cl. 308—201 **2 Claims**



1. A ball bearing separator assembly which can accommodate a non-circular configuration imposed by a wave-generator, comprising:

a flexible annular ball bearing separator having a plurality of axially arranged partitions circumferentially spaced on one side thereof;

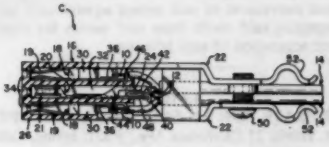
a flexible annular retention ring matable with said partitions, thereby defining a plurality of spaced ball pockets thereabout, both said separator and said retention ring having their radially inner and their outer surfaces curved to produce an assembly having reduced radial dimensions between adjacent partitions to facilitate manufacture and flexing thereof; and integral heat distortable interlocking means for securing said axially arranged partitions and said retention ring, to permit said separator and said retention ring to bend together.

4,451,099

ELECTRICAL CONNECTOR HAVING COMMONING MEMBER

Harry C. Bricker, Jr., Elizabethtown; David H. Gutter, Harrisburg, and Robert S. Stull, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 7, 1982, Ser. No. 376,077
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **10 Claims**



1. An electrical connector comprises a dielectric housing having rows of electrical terminals secured in passageways, conductor-terminating sections of one row of electrical terminals are to be terminated to respective signal conductors of a cable and connecting sections of the other row of electrical terminals are to be connected to ground conductors of the cable, characterized in that:

said connecting sections comprise receptacle sections in the form of substantially rigid members and opposing spring members;

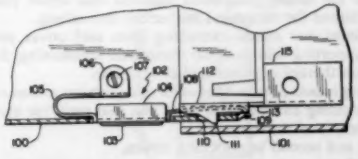
a commoning member is terminatable onto the ground conductors thereby forming an elongated tab member electrically connectable between said rigid members and opposing spring members.

4,451,100

GROUNDING LATCH APPARATUS FOR ELECTRICAL CONNECTORS

Frank C. Jaconette, Trumbull, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Nov. 5, 1981, Ser. No. 318,378
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **4 Claims**



1. A latching apparatus for an electrical connector assembly of the type including first and second telescopically joinable housings, each housing having an open end and containing electrically conductive members exposed to the open end thereof for making contact when the housings are joined in a predetermined relative orientation, and each housing carrying a portion of the latching apparatus which comprises

a latch member having

a tooth,

means defining a lateral surface attached to and extending perpendicular to said tooth near the inner limit thereof, and

a spring arm connected at one end to said means defining said surface and at the other end to a first one of said housings;

means on said second one of said housings for receiving said tooth when said housings are joined, said tooth being urged therein by said spring arm;

a manually operable release mechanism on said second one of said housings comprising

a leaf spring within said second one of said housings and adjacent said means for receiving, at least one end of said leaf spring being fixedly attached to said second housing,

said leaf spring being positioned to extend in generally parallel relationship with said surface when said housings are joined; and

means for providing access to said leaf spring to permit manual movement of said spring against said surface for disengaging said tooth from said means for receiving to permit separation of said housings.

4,451,101

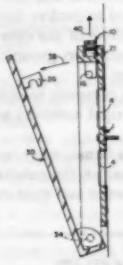
COVER PLATE FOR AN ELECTRICAL RECEPTACLE

Thomas A. Davis, 21 California Ave., #331, Irvine, Calif. 92715

Filed Jun. 21, 1982, Ser. No. 390,619

Int. Cl.³ H01R *13/447*; H05K *5/03*

U.S. Cl. 339—44 M **6 Claims**



1. A combination including a cover plate having an aperture for receiving therethrough electrical receptacle means and a safety guard plate for preventing unauthorized access to said receptacle means, said combination comprising:

means for pivotably connecting together respective first ends of said cover plate and safety guard plate, so that said guard plate may be rotated to a position over said cover plate by which to prevent access thereto,

push bar means positioned adjacent said cover plate and adapted for reciprocal movement therealong,

retaining bar means extending from said cover plate for supporting said push bar means and maintaining the position thereof adjacent said cover plate,

spring means disposed between said push bar means and said retaining bar means so as to bias said push bar means for reciprocal movement,

first and second interlocking means,

said first interlocking means connected to said safety guard plate for receipt of said second interlocking means when said guard plate is rotated over said cover plate, and

said second interlocking means connected to said push bar means so as to be received by said first interlocking means and thereby releasably secure said safety guard plate over said cover plate.

4,451,102

ELECTRICAL PLUG

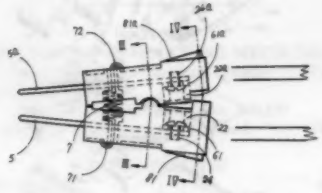
Chuan Reh, No. 4-1, La. 460, Shing Min Rd., Nei Hu District, Taipei, Taiwan

Filed Mar. 25, 1982, Ser. No. 361,969

Int. Cl.³ H01R *4/48*

U.S. Cl. 339—74 R **7 Claims**

1. An electrical plug comprising two substantially identical members longitudinally connected face-to-face with each other, each member at an inner side comprising four sections including, in sequential order from a rear end to a front end thereof, a support section defining a groove for accommodating a connecting wire, a terminal receiving section having a recessed platform and a central polygonal hole to receive a terminal screw, a fulcrum section forming a pair of semi-circular protrusions spaced apart from each other and a pair of semi-circular recesses at the remainder spaces, and a spring retention section having a platform at a level lower than that of the platform at said terminal receiving section and a central through hole retaining a coil spring which has a hook at both ends extending and fastening at an outer side of both members



respectively to connect said members together, and at the front end a conductor integrally formed therein, said members being movable to a position wherein they are disposed substantially 90° with respect to each other, in which position the platforms in the spring retention sections of said members can be placed in contact with each other to facilitate fastening of said hooks of said spring at the outer sides of said members when assembling said members, said members being then movable to a position in which they are longitudinally connected face-to-face to tension said spring.

4,451,103

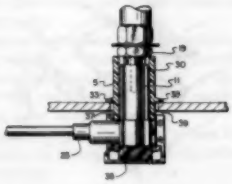
CONNECTOR ASSEMBLY

Lloyd V. Buresh, Cedar Rapids; Garth D. Hammond, Marion; Emil J. Koval, Marion, and Vernon R. McCormick, Marion, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 14, 1981, Ser. No. 330,370

Int. Cl.³ H01R *17/04*

U.S. Cl. 339—93 R **8 Claims**



1. A connector assembly for coupling a connector to a plate-like member having opposed sides and an opening through said plate-like member for receiving the connector assembly, the connector assembly comprising:

a first connector member having first and second end portions and an intermediate portion coupled between said end portions along an axis, said intermediate portion being configured to extend through said opening and spaced therefrom to allow movement of said intermediate portion in a radial direction relative to said axis, said first connector member having a tubular configuration and said first end portion being constructed and arranged to receive a tubular first connector element and said second end portion being constructed and arranged to receive a tubular second connector element, said tubular first and second connector elements being coupled through said intermediate portion to provide an electrically conductive path;

means coupled to said first end portion for forming a projec-

tion in the form of a ring circumferentially extending around said first end portion and extending generally radially from said axis;

means coupled to said second end portion for forming a retaining member in the form of a ledge circumferentially projecting from said second end portion; and

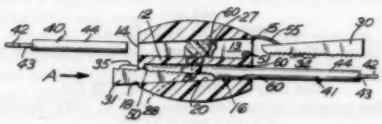
a second connector member coupled to receive said second end portion and including means for engaging said retaining member to form a cap over said second end portion and the second connector element received by said second end portion, said cap being constructed in the form of a tubular member having a first closed end and a second open end receiving said second end portion, and having a retaining groove which engages said retaining ledge of said second end portion to retain said cap on said second end portion, said projection and said second connector member being spaced from one another on opposite sides of said plate-like member to retain said intermediate portion within said opening, yet allow a predetermined movement of said first connector member in a direction parallel to said axis.

4,451,104

APPARATUS FOR SPLICING ELECTRIC WIRES

Sten E. Hodgson, Scotch Plains, and Richard J. Gemra, Union Township, Union County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 27, 1982, Ser. No. 382,748
Int. Cl.³ H01R 9/08
U.S. Cl. 339—99 R **7 Claims**



1. Apparatus for splicing electric conductors comprising:

a housing having a passage extending therethrough;

a partition extending through the housing dividing the passage into two through channels;

a ramped-shaped wall positioned in each channel opposite the partition for defining each channel with a wide opening at one end and a narrow opening at the other end;

an electrically conductive terminal embedded in the partition and protruding into each channel at an acute angle toward the one end of each channel; and

a pair of wedge shaped members each of which being adapted to be force fitted into the one end of each channel after an electric conductor has been inserted into the other end of each channel to fit between the ramped-shaped wall and the inserted conductor to force the conductor down onto the terminal to make electrical contact with the terminal and to lock the electric conductor between the partition and the force fitted wedge shaped member in each channel to effect a splice between the inserted electric conductors.

4,451,105

ELECTRICAL CONNECTOR DEVICE

Yoshimi Sakurai, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 347,799
Claims priority, application Japan, Feb. 13, 1981, 56-20338
Int. Cl.³ H01R 39/02
U.S. Cl. 339—113 R **7 Claims**

1. An electrical connector device comprising:

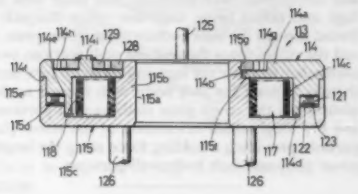
a first insulator having at least one first terminal affixed thereto;

a first shaft member projecting from said first insulator;

a second insulator rotatably fitted over said first shaft member and having at least one second terminal affixed thereto;

a second shaft member secured to said second insulator;

a flexible conductor in the form of a wire having one end thereof connected to said first terminal and the other end thereof connected to said second terminal, said conductor being wound around said first shaft member; and



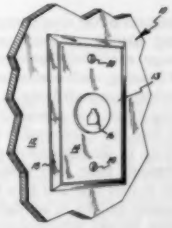
restriction means for limiting relative rotation between said first and second insulators within a predetermined angle, said restriction means including a first gear of a relatively large diameter fitted over said first shaft member for angular movement therewith and a second gear of a relatively small diameter held in meshing engagement with said first gear for angular movement about said second shaft member, one of said first and second gears including an enlarged gear tooth.

4,451,106

SNAP IN COMMUNICATIONS JACK AND COVER PLATE ASSEMBLY

Ronald W. Wiseheart, Hector, and Daniel Meyer, Rochester, both of Minn., assignors to Communication Systems, Inc., Hector, Minn.

Filed Oct. 7, 1981, Ser. No. 309,234
Int. Cl.³ H02B 1/02
U.S. Cl. 339—123 **2 Claims**



2. A communication jack and cover plate assembly comprising:

a cover plate having a face, a back surface, and the cover plate being provided with a cover plate jack opening therethrough;

a cover plate wall circumscribing the jack opening having two longitudinally configured resilient straight parallel spaced-apart cover plate wall portions, integral with and extending away from the back surface of the cover plate and oriented longitudinally along the back surface of the cover plate;

a jack body, formed of nonconductive material, provided with a communications jack opening;

the jack body being partially defined by a peripheral surface of a shape to mate with the cover plate wall to position the

communications jack opening in precise alignment with the cover plate jack opening;

the jack body having first and second longitudinally configured jack body wall portions positioned for snug adjacent alignment with the spaced-apart cover plate wall portions and when said jack openings are aligned with each other; and

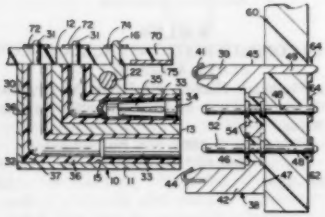
said cover plate wall portions each being provided with a lug and the jack body wall portions being each provided with a ridge, so that the lugs and the ridges lie in an interfering relationship with each other, the configuration of said cover plate wall portions, jack body wall portions, lugs, and ridges being such that when the jack body is forced toward the back surface of the cover plate, the lugs and the ridges force the resilient wall portions away from each other to allow the lugs and ridges to pass each other, thereby locking the jack body with respect to the cover plate when the cover plate resilient wall portions return and the longitudinal orientation of the cover plate wall portions providing a holding force along the length of the cover plate and jack body wall portions.

4,451,107

HIGH SPEED MODULAR CONNECTOR FOR PRINTED CIRCUIT BOARDS

Frank P. Dola, Port Richey, and John H. Lauterbach, Clearwater, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1982, Ser. No. 410,197
Int. Cl.³ H01R *4/66, 13/648*
U.S. Cl. 339—143 R **7 Claims**



1. Electrical connector of the type comprising an electrically conductive housing having at least one row of passages therein, each passage extending between a first face and a second face of said housing, each connector further comprising a plurality of electrical terminals lying in respective passages, each terminal having a first end at said first face and a second end at said second face, each terminal being surrounded by a dielectric sleeve lying in the respective passage, said sleeves insulating said terminals from said housing, said connector being characterized in that said first face and said second face are substantially planar and lie in substantially perpendicular planes, said passages having substantially right angle bends therein, said sleeves and said terminals likewise having substantially right angle bends therein.

4,451,108

DATA-TERMINAL SERVICE OUTLET

Donald D. Skidmore, 12 Bloomer Rd., Brewster, N.Y. 10509

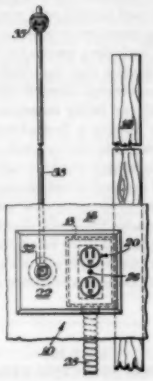
Filed Aug. 30, 1982, Ser. No. 412,924
Int. Cl.³ H01R *13/74*
U.S. Cl. 339—177 R **7 Claims**

1. A data-terminal-service outlet for providing a unitary service at which a digital-data-terminal may be connected to a computer and a source of electrical power, comprising:

an electrical-power outlet box with an open face;

an electrical-power-plug receptacle mounted in said outlet box;

a cover plate being mounted over said open face of said outlet box and having an aperture exposing said receptacle, said cover plate lying substantially all in one plane and having an extended portion projecting beyond and away from said box; and



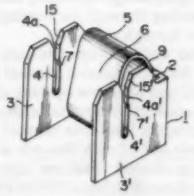
a digital data coupling means in said extended portion of said cover plate for coupling digital signals via two cables, respectively, from one side to the other side of said plate, respectively, between said data terminal and said computer.

4,451,109

CONNECTOR TERMINAL

Nori Inoue, Suzuka, Japan, assignor to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed May 17, 1982, Ser. No. 378,720
Claims priority, application Japan, Feb. 10, 1981, 56-17431
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—258 S **3 Claims**



1. A connector terminal for use with a junction block incorporating therein a number of web-like conductor strips, comprising:

a base plate;

a pair of opposing side walls extending from both side edges of said base plate substantially at a right angle to the plane of said base plate;

slots formed in the respective side walls for receiving one of the conductor strips, each of said slots extending substantially in parallel with said base plate over a predetermined length from one end of each of said side walls, said slots being substantially in alignment with each other; and

a resilient tongue extending from the upper end of said base plate into the space inside of said side walls, said resilient tongue including a curved portion extending from the upper end of said base plate into said space at such a curvature as to convex to the upper side and terminating at a terminal end located at a position slightly offset from the inner surfaces of said slots adjacent to said resilient

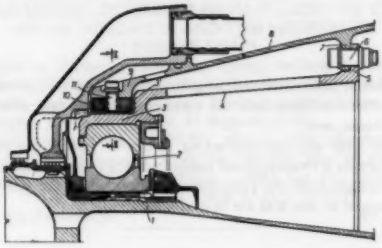
tongue, and a linear portion extending obliquely downwardly toward said slots.

4,451,110

TURBINE BEARING

Alexandre Forestier, Vaux le Penil, and Alain M. J. Lardellier, Melun, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Apr. 26, 1982, Ser. No. 371,937
Claims priority, application France, Apr. 29, 1981, 81 08516
Int. Cl.³ F16C *27/00*
U.S. Cl. 308—184 R **3 Claims**



1. A bearing assembly comprising:
a stationary support;
an outside bearing retainer;
a squirrel cage assembly elastically connecting said outside retainer to said support; and
an annular stop unitarily formed with said support, said annular stop including a portion surrounding a portion of said outside retainer, with a predetermined radial clearance therebetween,
wherein said portion of said outside retainer comprises first radial teeth on said outside retainer, wherein said portion of said stop comprises second radial teeth on said stop and circumferentially interlocking with said first radial teeth with a predetermined circumferential clearance therebetween, and wherein said portion of said stop further comprises two sets of third radial teeth, said sets being axially spaced by the axial thickness of said first radial teeth plus twice a predetermined axial clearance between said first and third radial teeth, and with said first radial teeth positioned between said sets, whereby circumferential and axial movements of said race are limited.

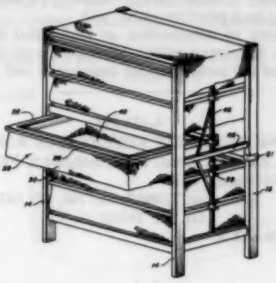
4,451,111

LIGHTWEIGHT DRAWER SUPPORT ASSEMBLY HAVING COMBINATION LOCKING MECHANISM AND COMMON VERTICAL DRAWER SUPPORT

Warren T. Munroe, 8 Birthwood Rd., Windham, N.H. 03087

Filed Apr. 7, 1983, Ser. No. 482,771
Int. Cl.³ E05B *65/46*
U.S. Cl. 312—221 **14 Claims**

1. A lightweight drawer assembly, comprising:
a hollow, substantially rectangular, frame having open walls;
a plurality of open, substantially rectangular, drawer support frames having depending flexible compartments;
first means coupled to said frame for supporting said plurality of drawers one on top of the other in vertically stacked alignment within said hollow interior of said frame in a closed condition;
second means slidably mounted to the open side walls of said frame, coupled to said plurality of drawers, and cooperative with said first means, for supporting any one of said drawers in an open condition out of said hollow interior of said frame; and
third means mounted to said frame, and cooperative with said second means, for latching said drawers in a closed



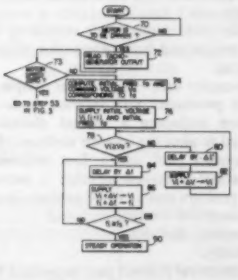
condition in response to any drawer being in an open condition.

4,451,112

METHOD AND APPARATUS FOR CONTROLLING AC MOTOR

Motonobu Hattori; Yasuharu Tamuro, both of Narashino; Akira Ishibashi, and Kenji Nandoh, both of Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,649
Claims priority, application Japan, Jan. 30, 1981, 56-11681
Int. Cl.³ H02P *1/26, 1/28, 1/30*
U.S. Cl. 318—778 **12 Claims**



1. In a control apparatus for an induction motor wherein an alternating current power source is connected to the motor through a switch and a frequency converting means and the motor speed is controlled by controlling the output frequency and the output voltage of said frequency converting means, a method for controlling said induction motor which is running by the inertia in case of reenergizing said motor comprising:
a first step of causing said frequency converting means to produce at a time of starting of said motor an initial frequency which is expected to cause the absolute value of the current flowing in said free-running induction motor to become substantially minimum and an initial voltage which is insufficient to drive said motor;
a second step of increasing said output voltage gradually from said initial voltage with said initial frequency maintained; and
a third step of increasing said output frequency and output voltage, with the ratio therebetween being maintained almost at a predetermined value, after said output voltage has reached a predetermined value,
wherein said first step includes:
a fourth step of causing said output voltage to be used as a search voltage which is insufficient to drive said motor, and varying said output frequency and said search voltage

with the ratio therebetween being maintained at a predetermined value;

a fifth step of detecting the motor current while said output frequency is varied for a variation of said output frequency by a pregiven value; and

a sixth step of determining, as said initial frequency, an output frequency which corresponds to the minimum value of the motor current detected in said fifth step.

4,451,113

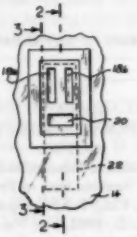
MAGNETIC SAFETY RECEPTACLE AND PLUG

Michael A. Zuniga, Carmel, Calif., assignor to Mid Coast Electronics, Monterey, Calif.

Filed Aug. 2, 1982, Ser. No. 404,643

Int. Cl.³ H01R *11/30*

U.S. Cl. 339—12 R **6 Claims**



1. A safety receptacle and plug comprising:

a receptacle assembly including

support means having an exterior surface and an interior surface,

a first electrical contact pair extending through said support means and having exterior surfaces and interior surfaces,

an over-center drop-out member coupled to said support means proximate said interior surface, said drop-out member including a second electrical contact pair adapted to abut the interior surfaces of said first electrical contact pair, and a first ferromagnetic member, where said drop-out member is movable between an open position and a closed position in contact with said first electrical contact pair; and

a plug assembly including

a plug body,

a third electrical contact pair supported by said plug body and adapted to abut the exterior surfaces of said first electrical contact pair,

and a second ferromagnetic member carried by said plug body;

whereby when said third electrical contact pair abuts said first electrical contact pair magnetic attraction between said first ferromagnetic member and said second ferromagnetic member causes said drop-out member to move to said closed position.

4,451,114

METHOD FOR RECORDING AND RECONSTRUCTING PULSE LASER HOLOGRAMS IN COLOR

Peter Nicholson, and Kalina Nicholson, both of Flushing, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,709

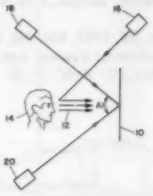
Int. Cl.³ G03H *1/26*

U.S. Cl. 350—3.75 **13 Claims**

1. A method for reconstructing a hologram which was recorded with at least two pulse laser beams having different wavelengths, said method serving to increase the illuminance of the image recorded in at least one of the recorded channels and comprising the steps of:

generating a first reconstruction beam at a wavelength which is shifted from the wavelength of the one recording beam which would have the lesser illuminance if the two recording beams had equal irradiance, wherein the wavelength shift is in the direction of the wavelength of the other recording beam;

generating a second reconstruction beam at a wavelength shifted, from the wavelength of the other recording beam, in the same spectral direction and by substantially the



same number of wavelengths as the shift of the first reconstruction beam from the wavelength of said one recording beam; and

directing said reconstructing beams at said hologram to obtain a reconstructed image, whereby the reconstructed images from the two reconstruction beams are generally equal in size and are in co-registration.

4,451,115

DETACHABLE COUPLING FOR OPTICAL FIBRES

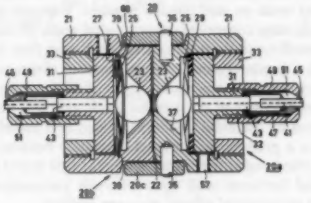
Antonius J. A. Nicia; Cornelis J. T. Potters, and Antonius H. L. Tholen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,886

Claims priority, application Netherlands, Jul. 19, 1979, 7905610

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.18 **3 Claims**



1. A detachable connector for coupling a pair of optical fibers comprising:

two connector elements, each connector element comprising:

a cylindrical housing having a reference end face and having a circularly cylindrical bore extending from the reference end face and transverse thereto, said bore having an axis and beginning with a narrow portion at the reference end face and widening with increased axial distance from the reference end face to form a conical seat and to form a rim which is parallel to the reference end face;

a spherical lens accomodated in the widening portion of the bore in the housing;

a disc-shaped fiber holder having a flat side and a bore for accomodating an end of an optical fiber, the bore being perpendicular to the flat side, said fiber holder being arranged in the bore of the housing to slide along the axis;

means for adjusting the axial displacement of the fiber holder;

means for adjusting the displacement of the fiber holder parallel to the reference end face; and

a lens clamp, secured in a groove in the housing, for securing the lens in the conical seat;

said detachable connector further comprising:

a connector holder; and

means for detachably connecting each connector element to the connector holder such that the reference end faces of the connector elements contact each other.

4,451,116

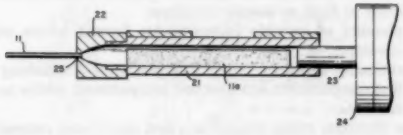
INFRARED TRANSMITTING FIBER OPTICAL WAVEGUIDE EXTRUDED FROM HALIDES OF THE METAL THALLIUM AND THE METHOD OF PREPARATION

Douglas A. Pinnow, Wallingford, Conn.; Anthony L. Gentile, Thousand Oaks, Calif.; Arlie G. Standlee, Thousand Oaks, Calif., and Arthur J. Timper, Torrance, Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 37,581, May 9, 1979, abandoned, which is a continuation of Ser. No. 800,149, May 24, 1977, abandoned. This application Feb. 2, 1981, Ser. No. 230,923

Int. Cl.³ G02B *5/14*; C03B *37/025, 37/075*

U.S. Cl. 350—96.34 **4 Claims**



3. As a new article of manufacture, an optical fiber of thallium bromoiodide which is extruded in the presence of heat in the range of 200° C. to 350° C.

4,451,117

DIGITAL WATCH MAGNIFYING ELEMENT

Robert C. Goode, R.D. #1, Box 42, West Sand Lake, N.Y. 12196

Filed Nov. 4, 1983, Ser. No. 548,635

Int. Cl.³ G02B *27/02*; G04B *47/00*

U.S. Cl. 350—114 **1 Claim**

1. A magnifying element for use with a digital watch having a face to magnify the numerals of such watch to facilitate reading the time thereby, said magnifying element having a face side and an adhesive coated side, said adhesive coated side having a tear strip removable to expose said adhesive coated side, said adhesive coated side of said magnifying element being affixed to said digital watch face by appropriate manipulative pressure applied to said face side of said magnifying element.

4,451,118

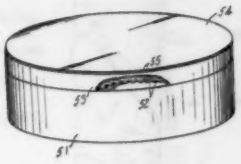
COMPOSITE LASER MIRROR

Robert K. Stalcup, Lake Park; Warren R. Sigman, North Palm Beach, both of Fla., and Karl M. Prewo, Vernon, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1980, Ser. No. 219,770

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—310 **9 Claims**



1. A laser mirror comprising a base section attached to a backing section having a laser radiation reflecting surface, the base section comprising a glass matrix reinforced with a plurality of graphite fibers oriented in at least one plane parallel to the mirror surface, the backing section disposed between the base section and the reflecting surface and comprising a glass matrix reinforced with a plurality of graphite fibers oriented perpendicular to the reflecting surface.

4,451,119

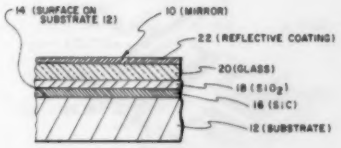
COMPOSITE MIRROR AND METHOD OF CONSTRUCTION

John J. Meyers, Penfield, and John C. Pulver, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,475

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—310 **13 Claims**



1. A mirror comprising a carbon-carbon substrate supporting an adherent optical coating of high reflectivity.

4,451,120

CHIMNEY OBSTRUCTION DETECTION APPARATUS

Frank R. Stape, P.O. Box 379, Bartlett, Ill. 60103

Filed Jun. 15, 1982, Ser. No. 388,518

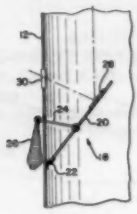
Int. Cl.³ G02B *7/18*

U.S. Cl. 350—319 **16 Claims**

1. An inspection apparatus for the detection of obstructions of furnace flue pipes having a hollow portion therein for venting of flue gases, the improvement comprising:

plate means sealed within said hollow flue pipe portion operatively coupled at it's lower end portion with the interior of said flue pipe for reflecting light entering said hollow flue pipe portion through said flue pipe's upper end portion while said plate means is in a use position and said plate means being movable from a non-use position adjacent an interior wall of said flue pipe out of the way of venting flue gases to a use position within said hollow flue pipe portion forming an acute angle with said flue pipe;

moving means, pivotally coupled to said plate means, through said flue pipe, for moving said plate means from said non-use position out of the way of venting flue gases to said use position allowing said moving means to be in a plane adjacent the exterior of said flue pipe when said plate means is in said non-use position; and



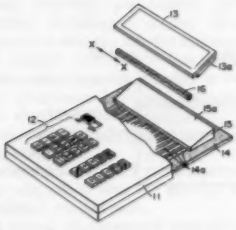
sight means in said flue pipe, sealing said flue pipe, for viewing light entering said hollow portion through said upper end portion and reflected by said plate means when in said use position thereby enabling detection of an obstruction of said flue pipe.

4,451,121

ELECTRONIC APPLIANCE

Hideo Fushimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 102,789, Dec. 12, 1979, abandoned. This application Jun. 22, 1982, Ser. No. 390,940
Claims priority, application Japan, Dec. 15, 1978, 53-155236
Int. Cl.³ G02F *1/13;* H01L *39/02*
U.S. Cl. 350—331 R **6 Claims**



1. An electronic appliance, comprising:

display means, having signal introducing terminals, for performing a display based on signals input thereto through said signal introducing terminals;

a printed base board provided with printed wirings thereon connectable to said signal introducing terminals of said display means;

a wedge-shaped table having an inclined surface for directly mounting said display means and being inclined with respect to said printed wirings provided on said printed base board, said table further being mounted on said printed base board and being formed of an insulating material that does not provide electrical contact between said display means and said printed base board; and

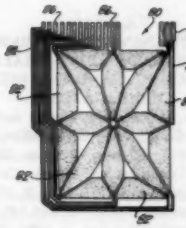
an electrically conductive member for electrically connecting said printed wirings of said printed base board and said signal introducing terminals of said display means and interposed between said printed base board and said display means.

4,451,122

MULTICOMPARTMENT ELECTRO-OPTIC DISPLAY DEVICE

Chan S. Oh, Diamond Bar, and Gordon Kramer, Huntington Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 220,653, Dec. 29, 1980, abandoned. This application Apr. 22, 1981, Ser. No. 256,337
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—334 **14 Claims**



13. An electro-optic analog display device comprising:

at least two plates joined together in parallel relation to each other to form an interior envelope;

a plurality of separate compartments formed within said envelope;

partitioning means on one of said plates for establishing a first compartment and a second compartment within said envelope;

one electrode means located in a first one of said compartments;

another electrode means located in a second one of said compartments, said first and second ones of said compartments forming separate analog display areas;

a first liquid crystal material in said first and second one of said compartments; and

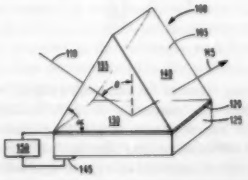
a second liquid crystal material in a third one of said compartments, said third one of said compartments being a background area of said display adjacent at least one of said first and second one of said compartments, activation of one of said one and another electrode means causing said first liquid crystal material to be the optical equivalent of said second liquid crystal material in said third compartment.

4,451,123

HIGH FREQUENCY LIGHT MODULATION DEVICE

William H. McNeill, Carlisle, and Yung J. Chen, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 20, 1982, Ser. No. 451,647
Int. Cl.³ G05D *25/02*
U.S. Cl. 350—386 **22 Claims**



1. An electrooptic device for varying the intensity of a collimated monochromatic light beam, said device comprising

a first element transparent to said monochromatic light beam and having a planar surface; a second element of a material of negative dielectric constant in contact with said planar surface to form an interface therewith; a third element of a semiconductor material adjacent to said second element; and means for varying the charge density of semiconductor material in said third element to affect the degree of coupling between said monochromatic light beam incident upon said interface and surface plasmon waves generated in said second and third elements whereby the intensity of said collimated monochromatic light beam varies with the charge density.

4,451,124
PHOTOGRAPHIC LENS OF CONTINUOUSLY VARIABLE FOCAL LENGTH

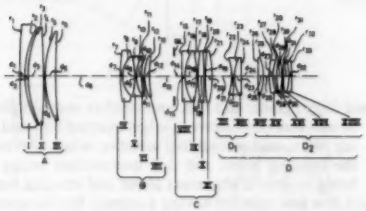
Heinrich Basista, Königsbronn, and Erhard Glatzel, Heidenheim, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,341

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140378

Int. Cl.[3] **G02B** *7/04, 15/00*

U.S. Cl. 350—427 **2 Claims**



1. A photographic lens of continuously variable focal length consisting of four lens groups comprising, in sequence from front to rear along an optical axis:

(a) a first group (A) of converging refractive power;

(b) a second group (B) of diverging refractive power;

(c) a third group (C) of converging refractive power; and

(d) a fourth group (D) of converging refractive power;

(e) said lens groups being so dimensioned and arranged that a change in the focal length is effected by displacing diverging lens group B and converging lens group C along the optical axis relative to each other and relative to groups A and D while maintaining a constant back focus;

said lens being characterized by the features that:

(f) an iris diaphragm (BL) is located between group B and group C;

(g) the third lens group C has a focal length which is numerically greater than the focal length of lens group B by a factor not less than 1.42 and not more than 1.73;

(h) the fourth less group D is formed of two parts (D_1 and D_2) separated from each other by a clear air space;

(i) the first part D_1 of the fourth lens group is of negative power;

(j) the second part D_2 of the fourth group is of positive power;

(k) said first part D_1 comprises a compound member formed of at least two elements; and

(l) the focal length of said first part D_1 is numerically greater than the focal length of the third lens group C by a factor not less than 1.16 and not more than 1.42;

the respective elements of the lens being dimensioned substantially in accordance with the data in the following table, the respective symbols in the table having the meanings explained in the accompanying specification:

Lens element	Radii	Thicknesses and Spacings		n_d	V_d
	r_1 + 421.790				
I		d_1	3.0	1.75520	27.58
	r_2 + 64.470				
		d_2	1.8		
	r_3 + 69.282				
II		d_3	10.5	1.69100	54.71
	r_4 − 453.140				
		d_4	0.1		
	r_5 + 64.470				
III		d_5	7.0	1.69100	54.71
	r_6 + 339.850				
		d_6	0.5 40.523 53.897		
	r_7 + 113.824				
IV		d_7	1.2	1.71300	53.83
	r_8 + 17.278				
V		d_8	8.0	1.71300	53.83
	r_9 − 48.000				
		d_9	1.0		
	r_{10} + 25.664				
VI		d_{10}	3.2	1.75520	27.58
	r_{11} + 69.282				
		d_{11}	2.0		
	r_{12} + 37.585				
VII		d_{12}	3.0	1.75520	27.58
	r_{13} + 79.431				
		d_{13}	55.797 15.774 2.400		
BL	r_{14} ∞	iris diaphragm			
		d_{14}	15.245 4.749 4.829		
	r_{15} + 1122.000				
VIII		d_{15}	2.0	1.805518	25.43
	r_{16} + 32.545				
IX		d_{16}	8.0	1.61272	58.63
	r_{17} − 57.460				
		d_{17}	0.1		
	r_{18} + 99.283				
X		d_{18}	4.2	1.71300	53.83
	r_{19} − 172.776				
		d_{19}	0.1		
	r_{20} + 127.721				
XI		d_{20}	4.4	1.71300	53.83
	r_{21} − 68.293				
		d_{21}	2.528 13.024 12.944		
	r_{22} − 29.853				
XII		d_{22}	1.0	1.71300	53.83
	r_{23} + 20.834				
XIII		d_{23}	4.5	1.76180	26.95
	r_{24} + 227.110				
		d_{24}	10.7		
	r_{25} − 1729.000				
XIV		d_{25}	3.2	1.69100	54.71
	r_{26} − 35.737				
		d_{26}	4.1		
	r_{27} + 112.204				
XV		d_{27}	2.2	1.80518	25.43
	r_{28} + 32.315				
		d_{28}	2.7		
	r_{29} + 82.939				
XVI		d_{29}	3.3	1.46450	65.77
	r_{30} − 35.228				
		d_{30}	0.1		
	r_{31} + 97.166				
XVII		d_{31}	4.1	1.60311	60.60
	r_{32} − 22.386				
XVIII		d_{32}	1.5	1.80518	25.43
	r_{33} − 92.387				
	Back focus s′ = 28.53				

4,451,125

BEHIND APERTURE LENS SYSTEM

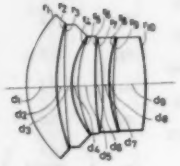
Shigetada Sato, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,235

Claims priority, application Japan, Mar. 26, 1982, 57-48525

Int. Cl.³ G02B 9/60

U.S. Cl. 350—465 **6 Claims**



1. A compact, five-element, high-performance behind aperture lens comprising a positive meniscus first lens, a negative second lens, a positive third lens, a biconcave negative fourth lens, and a biconvex positive fifth lens, said lenses being arranged in the order from the object side, said behind aperture lens system satisfying the following conditions:

(1) $1.15<f/f_{1,2}-1.55$

(2) $1.600<(\nu_1-\nu_2)/(\nu_1/n_1-\nu_2/n_2)$

(3) $1.200<f/n_4|f_{7,8}|<1.450, f_{7,8}<0$

(4) $2.10<f/f_1<3.00$

(5) $0.90<f_5/|f_4|<1.50, f_4<0$

(6) $0.60<f_{10}/f_7|<0.80, f_7<0$

(7) $1.00<f_9/|f_8|<1.30, f_8<0$

where

f: combined focal length of the overall lens system,

$f_{1,2}$: focal length of the first lens,

ν_i: Abbe number of the ith lens,

n_i: refractive index of the ith lens with respect to d-line,

$f_{7,8}$: focal length of the fourth lens,

f_1: focal length of the first lens on its surface on the object side,

f_4: focal length of the second lens on its surface on the image side,

f_5: focal length of the third lens on its surface on the object side,

f_7: focal length of the fourth lens on its surface on the object side,

f_8: focal length of the fourth lens on its surface on the image side,

f_9: focal length of the fifth lens on its surface on the object side, and

f_{10}: focal length of the fifth lens on its surface on the image side.

4,451,126

SURVEY OBJECTIVE

Horst Riesenberg, 3, Zenkerweg, and Margot Krahn, 4, Am Hang, both of, 69 Jena District of Gera, German Democratic Rep.

Filed Mar. 24, 1982, Ser. No. 356,558

Claims priority, application German Democratic Rep., May 27, 1981, 230323

Int. Cl.³ G02B 21/02, 15/00

U.S. Cl. 350—520 **1 Claim**

1. A survey objective of microscopes particularly for surveying microscopic objects, comprising

a bipartite survey objective constituted of a first lens member and a second lens member,

a lens turret,

a plurality of microscope objectives,

a microscope stage,

a revolving piece in a recess of said microscope stage,

an object plane,

an intermediate image plane,

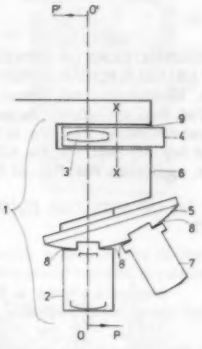
an imaging beam,

said first lens member and said plurality of microscope objectives being mounted on said lens turret in symmetrical spaced relation in opposition to said object plane,

said lens turret being seated for rotation in said microscope stage,

said second lens member being seated on said revolving piece, between said lens turret and said intermediate image plane,

said second lens member being insertable into said imaging beam,



said object plane, said first lens member and said plurality of microscope objectives, when inserted into said imaging beam, said second lens member, when inserted into the imaging beam, and said intermediate image plane being in optical alignment about said imaging beam,

said first lens member having a contact face in opposition to said lens turret,

said plurality of microscope objectives having each a contact face in opposition to said lens turret,

said object plane and said contact face of said first lens member and of said plurality of microscope objectives, respectively, when inserted into said imaging beam have an equal separation distance.

4,451,127

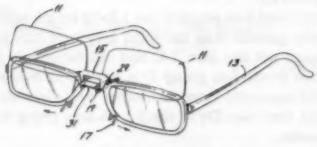
HALF-READER SUNGLASSES

Merritt L. Moffitt, Jr., 9 Weirwood Rd., Radnor, Pa. 19087

Filed Mar. 19, 1981, Ser. No. 245,308

Int. Cl.³ G02C 9/00, 7/02

U.S. Cl. 351—47 **2 Claims**



1. Clip-on sunglasses for half-reader eye glass frames, comprising:

a pair of juxtaposed sun lenses;

a rectangular plate having a pair of tabs, one each extending longitudinally outwardly from said opposite shorter ends of said plate, each tab engaging one of said lenses at the nose bridge adjacent portion thereof;

a rectangular cut-out section in said plate extending inwardly from a longer side of said plate;

a pivot shaft extending across the opening provided by said cut-out section and attached to either end of said plate and extending parallel thereto;

a bracket for holding said rectangular plate allowing for the pivoting of said rectangular plate and said a full 180° rotation thereby pivoting said sun lenses from one position to another lying in the same plate, said bracket being a box-like, body with trapezoidally-shaped configuration;

a first and second protrusions, extending outwardly, in parallel, from a respective either end of said bracket, each said protrusion being bifurcated to form in each a receiving socket which operates as a journal to receive, hold and allow rotation of said pivot shaft;

a wire clamp for attaching said to said half-reader eye glass frames, said wire clamp wrapping around said eye glass frames, and being attached to said bracket by passing completely therethrough, parallel to said pivot shaft.

4,451,128

METHOD OF AND A DEVICE FOR ADJUSTING A HIGH-SPEED PHOTOGRAPHIC ARRANGEMENT

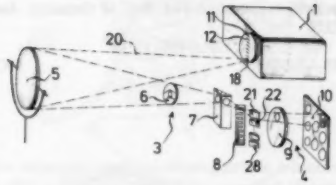
Frank Fruengel, Im Glockenacker 2, 8053 Zurich, Switzerland

Filed Jun. 29, 1982, Ser. No. 393,354

Claims priority, application Switzerland, Jul. 7, 1981, 4454/81

Int. Cl.³ G03B *41/00*

U.S. Cl. 352—84 **10 Claims**



1. A method of adjusting a high-speed photographic device of the type having a spark-discharge flash light unit provided with a plurality of discrete spark gaps, means for sequentially activating respective spark gaps with a time delay of one spark discharge, a projecting optical system and a deflecting optical system cooperating with the flash light unit to take a succession of separate images of the movement of an object and reproduce the images side-by-side on an image plane, comprising the steps of activating the spark gaps at an increased repetition rate to reproduce on the image plane a flicker-free test image of all spark discharges, and adjusting the projecting and deflecting optical systems to produce a test image of a desired quality.

4,451,129

CAMERA HAVING A PLURALITY OF BUILT-IN LENSES

Hideo Ikari, and Michio Hirohata, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,855

Claims priority, application Japan, Mar. 5, 1981, 56-31886; Mar. 5, 1981, 56-31887

Int. Cl.³ G03B *7/00*

U.S. Cl. 354—477 **17 Claims**

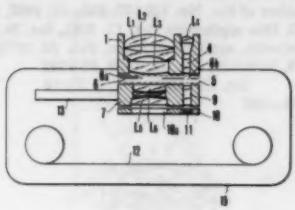
1. A camera having a plurality of built-in lenses and capable of selective operation at different focal lengths, comprising:

(a) at least first and second photo-taking lenses for enabling selection of different focal lengths,

(b) photosensitive means for converting light from an object to be photographed to an electrical signal;

(c) first light guide means for conducting the light from the object to said photosensitive means; and

(d) second light guide means for conducting light emerging from said first light guide means to said photosensitive means when the focal length due to the combination of



said first and said second photo-taking lens means is selected.

4,451,130

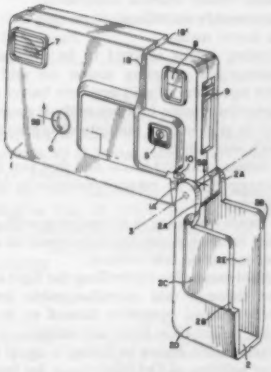
DISC CAMERA WITH HANDLE GRIP COVER

Chan K. Yan, North Point, Hong Kong, assignor to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Jun. 4, 1982, Ser. No. 385,328

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—82 **9 Claims**



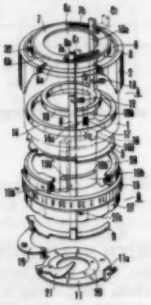
1. In a camera configured to receive a disc-shaped magazine and including a housing with front and rear walls having a lens window exposed on said front wall near one side margin of the housing and front and rear viewfinder windows exposed on the front and rear walls on the same side of said housing as the lens window, the improvement comprising a hollow handle for said housing and having spaced front and rear walls defining therebetween an open housing side-receiving recess, said handle being much narrower than the width of said housing so as to fit over only the side of said housing containing said lens and viewfinder windows, and attachment means mounting said handle to said housing for supporting the same for movement between a stable, releasable retracted position where said handle recess receives the latter side of said housing therein and where said front and rear handle walls cover said lens and front and rear viewfinder windows, and at least one stable, releasable extended position where said handle can be readily grasped by the hand corresponding to the side of the camera where said lens window is located, so that the user need not grasp the adjacent side of the housing inadvertently to cover the lens window near the margin thereof.

4,451,131

INTERCHANGEABLE CAMERA LENS ASSEMBLY

Seiichi Shimizu, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 122,177, Feb. 19, 1980, Pat. No. 4,299,470. This application Oct. 13, 1981, Ser. No. 310,874
Claims priority, application Japan, Feb. 23, 1979, 54-20257; Jul. 2, 1979, 54-91829; Jan. 18, 1980, 55-5102
Int. Cl.³ G03B 17/56, 17/14
U.S. Cl. 354—286 2 Claims



1. An interchangeable lens assembly for a single lens reflex camera having complementary coupling means and complementary retainer means thereon comprising:

a first lens assembly including

first lens barrel means,

first coupling means adapted to be engaged with said complementary coupling means on said camera by rotative operation of said first lens barrel means when said interchangeable lens assembly is mounted on said camera so as to couple said interchangeable lens assembly with said camera,

adapter means mounted inside said first lens barrel means and arranged to be rotative relative to said first lens barrel means,

retainer means operating in cooperation with said complementary retainer means on said camera so as to fix said adapter means on said camera,

light control means for controlling the light entering said camera through said interchangeable lens assembly either by manual operation thereof or in response to exposure information from said camera,

signal transmission means including a signal transmission member held by said adapter means for transmission of exposure control signals between said interchangeable lens assembly and said camera, and

second coupling means arranged at one end of said first lens barrel means;

a second lens assembly including

second lens barrel means, and

third coupling means for coupling said second lens barrel means with said first lens barrel means,

said second lens barrel means having a focus adjustable phototaking lens.

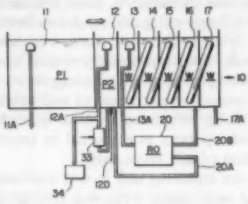
4,451,132

COLOR PHOTOGRAPHIC PROCESSING APPARATUS INCLUDING A REVERSE OSMOSIS APPARATUS

Shinzo Kishimoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 16, 1982, Ser. No. 450,278
Claims priority, application Japan, Dec. 17, 1981, 56-204726
Int. Cl.³ G03D 3/06
U.S. Cl. 354—324 12 Claims

1. A color photographic processing apparatus including color developing tank or tanks, blixing tank or tanks and wash water tank or tanks through which photographic materials are sequentially processed on passing the tanks, wherein the improvement comprises a reverse osmosis apparatus having a



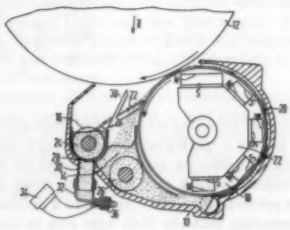
wash water inlet connected with the wash water tank(s), a condensed fluid outlet connected to said blixing tank(s) and a diluted water outlet connected with said wash water tank(s).

4,451,133

DEVICE FOR REMOVING THE DEVELOPER MIX FROM A DEVELOPING STATION

Walter Kopp, Taufkirchen, and Karl-Heinz Saalmueller, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,897
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117229
Int. Cl.³ G03G 15/08
U.S. Cl. 355—3 DD 5 Claims



1. In a developer station having a housing divided into a principal chamber, containing a supply of particle developer mix, at least one rotatable developer drum for conducting developer mix into contact with a charge image carrier surface, and a first rotary screw conveying means for moving developer mix passed into said principal chamber into engagement with said at least one developer drum, and a mixing chamber, containing a second rotary screw conveying means for transporting developer mix therealong to a discharge end passage leading from said mixing chamber to said principal chamber, apparatus for removing developer mix from said station comprising:

a drain opening formed in the floor of said housing adjacent said discharge end passage,

a discharge passage means communicating with said drain opening controllable to block or unblock flow therethrough, and

a transfer means comprising a plate member pivotably mounted in said housing adjacent said principal chamber movable between a first upraised position allowing developer mix to spill off said developer drum directly back into said principal chamber and a second lowered position for passing developer mix spilled off said developer drum directly into said mixing chamber for transport by said second screw conveying means to said drain opening, said

plate member having a lead edge for facing said developer drum, but which is spaced from the circumference of said developer drum in said second lowered position of said plate member, whereby said discharge passage means is unblocked and said developer drum and second screw conveying means are rotated to remove developer mix from said station.

4,451,134

MAGNETIC-BRUSH DEVELOPING DEVICE

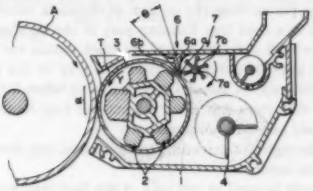
Masakazu Fukuchi, Hachioji; Keiji Oishi, Hino, and Yoshio Yamazaki, Mizuho, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,883

Claims priority, application Japan, Dec. 18, 1981, 56-203622; Dec. 18, 1981, 56-203623

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **6 Claims**



1. In a magnetic-brush developing device wherein a rotary sleeve with permanent magnet incorporated therein is positioned inside a housing containing a developer, and wherein the thickness of ears of developer formed on the peripheral surface of the rotary sleeve is regulated by a doctor blade, the improvement characterized in that a rotor which forcibly removes surplus developer scraped off by the doctor blade is provided just in front of said doctor blade.

4,451,135

TONER CONCENTRATION DETECTING DEVICE

Masanobu Okumura, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,019

Claims priority, application Japan, Apr. 20, 1982, 57-57266[U]

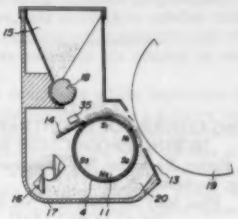
Int. Cl.³ G03G *15/06*

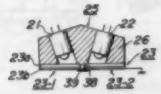
U.S. Cl. 355—3 DD **8 Claims**

1. In a toner concentration detecting device for detecting the toner concentration of a dry-type, two-component developer, said device comprising:

a housing, transparent plate-like means provided on said housing, means provided in said housing for projecting light toward the developer through the transparent plate-like means, means provided in said housing for receiving light scattered by the developer through the transparent plate-like means to produce a photoelectrically converted signal representing the toner concentration of the developer, and

means for separating optically the portion of said transparent plate-like means located opposite said light projecting means from the remaining portion of said transparent plate-like means located opposite said light receiving





means to eliminate multiple reflection inside said transparent plate-like means.

4,451,136

FEED CONTROL FOR COPYING APPARATUS

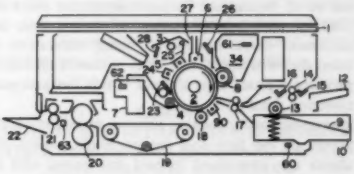
Hiroshi Tanioka, Tokyo; Masato Ishida, Kawasaki, and Tsuneki Inuzuka, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 213,593, Dec. 5, 1980, abandoned. This application May 29, 1984, Ser. No. 401,246

Claims priority, application Japan, Dec. 13, 1979, 54-161870

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **14 Claims**



1. Copying apparatus comprising:

means for forming a reproduced image of an original on a copy material

means for entering data necessary for image formation, said data entering means comprising instruction means for selecting the position of the reproduced image on said copy material;

means for performing timing control of said image forming means for image formation in response to the data entered by said data entering means, said timing control means comprising copy material feed control means provided with switching means to be actuated by said image forming means and timer means associated with said switch means, and timer control means for controlling operation of said timer means for shifting feed timing of said feed

control means in response to the instruction data supplied from said instruction means; and

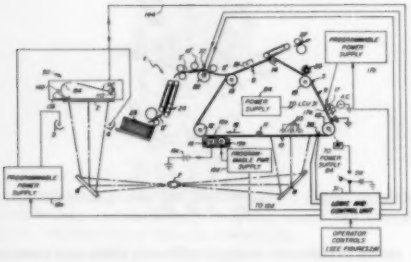
means for displaying feed timing of said feed means.

4,451,137

ADJUSTING COPIER COPY CONTRAST AND DENSITY DURING PRODUCTION RUNS

Ronald W. Farley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1982, Ser. No. 382,532
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **8 Claims**



1. Apparatus including a copier having an exposure station and a feeder for feeding a multi-sheet document one sheet at a time from a stack in the feeder to the exposure station said copier to produce copies of the document; said apparatus comprising:

control means for establishing a set of copy process parameters which condition said copier to produce a copy having acceptable contrast and density for any document sheet which exhibits contrast and density encompassed within a predetermined range of contrast and density, and these document sheets hereinafter being referred to as document sheets of the first kind;

means for adjusting said control means to establish a different set of parameters for each document sheet exhibiting contrast and density outside of such range, and these document sheets hereinafter being referred to as document sheets of the second kind, to condition said copier to produce a proof copy thereof which has acceptable contrast and density;

transport means for feeding seriatim to said stack document sheets of the first and second kinds, which document sheets are intermixed in said document, said transport means including means for presenting for exposure at said exposure station prior to movement to said stack, each document sheet of the second kind for the purpose of producing said proof copy thereof and means for feeding document sheets of the first kind to the stack without presenting for exposure at said exposure station document sheets of the first kind;

memory means coupled to said adjusting means and to said transport means for storing information which identifies the sequential positions of and the established sets of parameters for the document sheets of a document for which said copier was conditioned to make proof copies; and

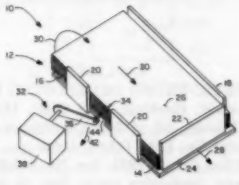
logic and control means operatively associated with said memory means for operating said feeder and said copier and for controlling said adjusting means so that said copier produces copies of the multi-sheet document having acceptable contrast and density.

4,451,138

ELECTROPHOTOGRAPHIC COPYING APPARATUS HAVING AN AUTOMATIC FEED ARRANGEMENT AND AN END-OF-FEED SENSING ASSEMBLY

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Systems, Inc., San Jose, Calif.

Filed Dec. 3, 1982, Ser. No. 446,555
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **8 Claims**



1. In an electrophotographic apparatus designed to make successive copies from a stack of original documents, automatically, by using a feeding arrangement configured to act on the stack in a way which successively moves each document onto a copying platen from the bottom of the stack when the latter is placed in a feed tray forming part of the arrangement and thereafter back onto the top of the stack within the tray along a looped path of movement from the tray to the platen and back to the tray, an assembly for detecting when the last document in that stack has moved from the tray to the copying platen, said assembly comprising:

(a) a through slot extending into said feed tray from one side of the latter;

(b) means located to one side of the feed tray adjacent said slot and therefore to one side of the looped path of movement of said original documents for movably supporting a sensing element on the top of said stack when the latter is within said feed tray such that the sensing element initially moves downward with the stack as it becomes smaller, thereafter through said slot as the last document in the stack is fed from the tray and then along a path of movement first along said one side of the tray, and ultimately onto the same stack which has been returned to the feed tray or onto a newly provided stack, whereby the feeding procedure can be repeated; and

(c) means responsive to the position of said sensing element for indicating when the last documents within the stack have left the tray.

4,451,139

CLEANING APPARATUS FOR PHOTOCONDUCTIVE ELEMENT

Nobuyuki Yanagawa, and Shinichi Kamiyama, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,733
Claims priority, application Japan, Sep. 4, 1981, 56-139425
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—15 **7 Claims**

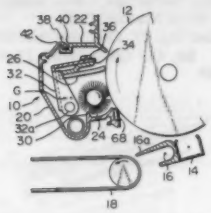
1. A cleaning apparatus for a photoconductive element, comprising:

cleaning means for removing toner particles remaining on the photoconductive element in contact therewith;

toner collecting means for collecting the toner particles removed by the cleaning means;

a casing accommodating the cleaning means and toner collecting means thereinside and movable in a direction perpendicular to an intended direction of movement of the photoconductive element; and

guide means formed in the casing at a location which is above the center of gravity position of the casing and



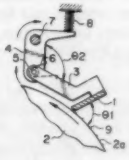
farther from the photoconductive element than the center of gravity position.

4,451,140

CLEANING BLADE UNIT

Kinzi Saito, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 8, 1982, Ser. No. 448,044
Claims priority, application Japan, Dec. 14, 1981, 56-201206
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **7 Claims**



1. A cleaning blade unit for removing any residual toner from the surface of a latent image carrier after a transfer step, comprising

a cleaning blade disposed in contact with a surface of the latent image carrier at an angle which is equal to or less than 90°;

a first holding member for holding the blade;

a second holding member for carrying the first holding member in an angularly movable manner which is pivotally mounted on the unit:

a spring member engaging both the first and the second holding member and urging the first holding member to move angularly in a direction to bring the forward edge of the blade into abutment against the surface of the latent image carrier; and

a bias member for urging the second holding member to move angularly in the same direction as the first holding member.

4,451,141

AUTOMATIC DEVICE FOR THE SIMULTANEOUS PRINTING AND DEVELOPMENT OF PHOTOGRAPHS

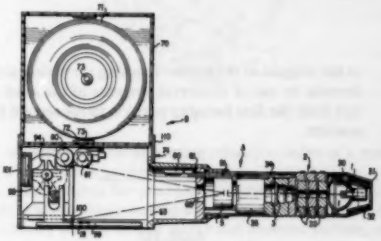
Claude Thebault, Meylan, France, assignor to Kis France, Grenoble, France

Filed Apr. 6, 1982, Ser. No. 366,074
Claims priority, application France, Apr. 15, 1981, 81 07737
Int. Cl.³ G03B *29/00*
U.S. Cl. 355—28 **5 Claims**

1. An automatic device for simultaneous printing and development of photographs, in particular color photographs, comprising:

an exposure unit comprising first and second sub-units adapted to be plugged into one another, said first sub-unit comprising an exposure lamp, a subtractive filter system and a diffuser extended at one end by conductive pins, said second sub-unit comprising a view-carrier frame for receiving film, an enlargement lens and a first shutter, said second sub-unit being traversed longitudinally by a conductive member, said conductive member comprising a jack adapted to receive said conductive pins of said first sub-unit, and an extension pin adapted to engage said dark-room unit;

a dark-room unit comprising a light impervious housing, a feed member for feeding paper, a primary member for advancing the paper, a planar surface on which the image to be reproduced transmitted from the lens is projected onto the paper, a cutter, a first light impervious slit in said light impervious housing through which said paper emerges, and a supporting frame located below said light impervious housing and comprising top, bottom and side portions, said top portion comprising rims adapted to



wedge the light impervious housing therebetween, and a primary second slit coinciding with said first light impervious slit for the passage of paper, said bottom portion comprising an orifice, said side portion comprising a second shutter and a nose-shaped protuberance projecting towards said exposure unit in which the exposure unit is adapted to be inserted and within which said second shutter is pivotable;

a development unit comprising a housing member, a pivotable cover, means for feeding the cut exposed sheet of paper, a series of development bath treatment sections, a drying section, and means intended to advance the cut exposed sheet within said treatment sections and within said drying section, and a funnel which coincides with said orifice for the passage of the cut exposed sheet of paper, said vertical dark-room unit being rigidly connected to said top cover of said development unit, said cover being pivoted to one end of said housing member.

4,451,142

METHOD OF AND APPARATUS FOR DETECTING INITIAL POSITION OF EASEL AND LENS IN PHOTOGRAPHIC APPARATUS

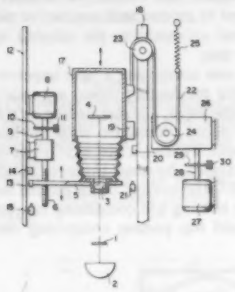
Yuji Takenaka, and Sumio Yoshikawa, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1981, Ser. No. 293,841
Claims priority, application Japan, Aug. 27, 1980, 55-118116
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—55 **3 Claims**

1. In a photographic system for printing an image of an original on a photosensitive material,

a method of detecting the initial positions of an easel and a lens comprising carrying out the first focusing by moving an easel and a lens the focal length of which is known in advance, to find out a position where the image seems to be focused by looking in the easel, and placing a photosensitive material in the easel, printing while moving the lens in the vicinity of the position, and finding out the sharpest photograph among the photographs obtained, and carry-

ing out the second focusing by moving the easel and the lens in the same manner at a different position, and determining the positions of the easel and the lens with respect



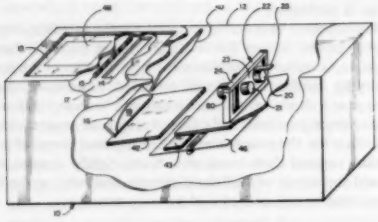
to the original at the second focusing according to the lens formula by use of the travel amounts of the easel and the lens from the first focusing position to the second focusing position.

4,451,143

COMBINATION DIRECT/REVERSE IMAGE COPY MACHINE

Joseph E. Goodman, Lawrenceville, Ga., assignor to Jofax Industries, Inc., Norcross, Ga.

Filed Apr. 12, 1982, Ser. No. 367,154
Int. Cl.³ G03B *27/70*
U.S. Cl. 355—66 **9 Claims**



1. A reprographic apparatus for making a photo copy of an original object, said apparatus comprising:

an image path defined between the original object and the copy;

a light source for illuminating said original object;

a right reading optical element assembly movable into and out of said image path;

a reverse image optical element assembly movable into and out of said image path and interchangable with said right reading optical element assembly;

baffle means positioned within said image path in the upper focal length of the optical element assemblies, said baffle means cooperating with said light source and each of said right reading optical element assembly and said reverse image optical element assembly to deliver uniform irradiance at the copy; and

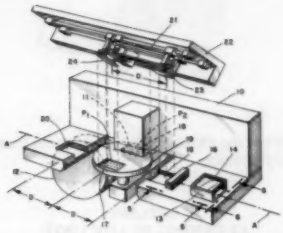
light blocking means positioned in fixed relationship relative to and movable with said right reading optical element assembly for reducing the amount of light entering said right reading optical element assembly.

4,451,144

AUTOMATIC LOADER FOR MICROFICHE DUPLICATORS

Karl H. Gensike, Northridge, Calif., assignor to Photomatrix Corporation, Santa Monica, Calif.

Filed Sep. 27, 1982, Ser. No. 423,525
Int. Cl.³ G03B *29/00, 27/04*
U.S. Cl. 355—99 **7 Claims**



1. An automatic loader for successively transferring microfiche from a loading station to a function station and from said function station to a collecting bin, including, in combination;

(a) first and second receiving platens at first and second spaced positions, said first position being aligned with and centrally located between said loading station and bin and said second position being at said function station;

(b) means for successively interchanging the positions of said first and second platens between said first and second positions; and

(c) shuttle means movable back and forth over said first position and including first and second microfiche pick-up means spaced apart in the direction of travel of said shuttle means such that when the shuttle means is at one end of its travel, the first and second pick-up means are positioned respectively over said loading station and said first position of a receiving platen, and when the shuttle is at its other end of travel, the first and second pick-up means are positioned respectively over said first position and said bin whereby when said shuttle means is at said one end of travel microfiche can be picked up from the loading and receiving platen at the first station simultaneously and when the shuttle means is at said other end of travel microfiche can be deposited on the receiving platen at the first station and in the receiving bin simultaneously, said means for interchanging the positions of said first and second platens effecting an exchange after each time a microfiche has been deposited on a receiving platen in said first position.

4,451,145

APPARATUS AND PROCESS FOR MAKING LITHOGRAPHIC PRINTING PLATE WITH REINFORCED IMAGE

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Scituate, Conn., assignors to Howard A. Fromson, Weston, Conn.

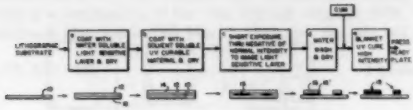
Division of Ser. No. 142,507, Apr. 21, 1980, Pat. No. 4,334,769, which is a continuation of Ser. No. 972,561, Dec. 22, 1978, abandoned. This application Apr. 20, 1982, Ser. No. 370,219
Int. Cl.³ G03B *27/30*; B41C *1/10*
U.S. Cl. 355—100 **12 Claims**

1. Process for making a lithographic printing plate which comprises:

(a) exposing to actinic light a lithographic plate having a water soluble light sensitive layer thereon and an overcoating of a solvent soluble, UV curable material, the intensity of said light being sufficient to form at least a latent image in the light sensitive layer and to adhere the

image to the overlying portions of the UV curable material without curing the UV curvable material;

(b) developing the plate with water to remove the light sensitive layer and overlying UV curable material in the non-image areas; and



(c) exposing the plate to a UV source having an intensity greater than the imaging light used in step (a) which is sufficient to cure the UV material adhered to the image to form a press-ready plate having a durable, reinforced cured image thereon.

4,451,146

TEST DEVICE FOR DETERMINING THE EXTINCTION VALUE OF A LASER RANGE FINDER

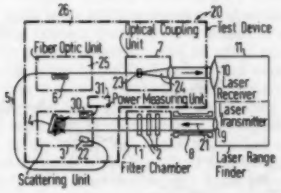
Ludger Grage, Eichenau, and Werner Ryseck, Oberschleisheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,400

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034942

Int. Cl.³ G01C *3/08*

U.S. Cl. 356—5 **14 Claims**



1. A test device for determining the extinction value of a laser range finder having a laser transmitter and a laser receiver, said device comprising an optical shield for shielding an unattenuated laser beam from the laser transmitter, a filter chamber containing attenuation filters being disposed in an optical beam path of the laser transmitter, a scatter unit having means for reflectively diffusely scattering the beam of laser light from the laser transmitter and including a reflective dispersion disk having a scatter range, an optical coupling unit for coupling light in a beam path into the laser receiver and at least one light waveguide line of a specific length having one end being disposed in the scatter range of the dispersion disk of the scatter unit to receive scatter light therefrom and the other end being positioned for releasing the light traveling in said waveguide into the optical beam path of the receiver so that the unattenuated beam of laser light from the transmitter is both attenuated and scattered prior to being coupled into the receiver.

4,451,147

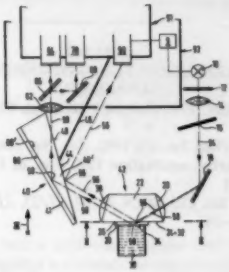
REFRACTOMETER

Karel Dobes, Fafnerstr. 8, D-8000 München; Peter Fuchs, Vimystr. 4, D-8050 Freising, and Otmar Rudolf, Kantstr. 24, D-8000 München, all of Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 276,515

Int. Cl.³ G01N *21/41*

U.S. Cl. 356—135 **26 Claims**



1. A refractometer for measuring refractive index of a media during a continuous process comprising:

light source means for producing a light beam,

a light prismatic body having a media surface contacting the boundary surface of said media and a mirror surface, said light beam being directed onto said mirror surface and said media surface to provide a reference light beam reflected from said mirror surface and a measurement light beam reflected from said boundary surface,

first means for receiving said reference beam and producing an electrical signal varying as a function thereof,

second means for receiving said measurement beam and producing an electrical signal varying as a function thereof, and

means for directing said reference and measuring beams respectively to said first and second means.

4,451,148

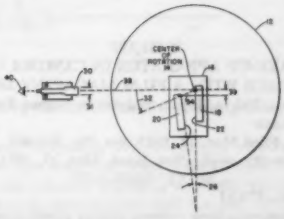
OPTICAL ANGULAR INTERVAL MARKER

Robert J. Magee, Concord, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 16, 1982, Ser. No. 348,879

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—138 **13 Claims**



1. An optical angular interval indicator comprising:

first and second optically reflecting surfaces generally facing each other and positioned with their reflecting surfaces slightly non-parallel forming a basic angle therebetween;

means for rotating said first and second reflecting surfaces in a plane generally orthogonal to said first and second reflecting surfaces;

means for projecting a collimated beam of light toward said first and second reflecting surfaces;

said rotating means orienting said first and second surfaces relative to said beam of light to permit varying numbers of multiple reflections therebetween and to return the multiply reflected beam of light toward said projecting means at integral multiples of said base angle in the rotation of said first and second reflecting surfaces; and

means associated with said projecting means for indicating the degree to which said returned beam of light departs from the path of its projection toward said first and second reflecting surfaces.

4,451,149

POLARIZATION FLUOROIMMUNOASSAY APPARATUS

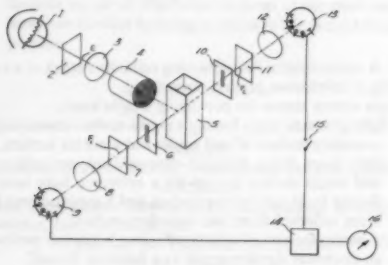
Hans G. Noeller, 1942 Deerpark Dr., Apt. 92, Fullerton, Calif. 92631

Filed Jul. 27, 1981, Ser. No. 286,862

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028591

Int. Cl.³ G01N *21/64, 21/21, 21/00*

U.S. Cl. 356—317 **4 Claims**



1. Apparatus for determining the extent of an immunoreaction by means of fluorescent tagged species comprising the combination of:

(a) an excitation light beam source for producing high intensity light for exciting fluorescent radiation in such tagged species;

(b) means for positioning a sample in the path of said excitation light beams;

(c) means for guiding the light beam to the sample while shielding the sample from the heat of the beam;

(d) means in the excitation light beam path for polarizing the excitation light beam directed toward the sample position; and

(e) means for measuring fluorescent light emitted from the sample.

4,451,150

FILM TAKE-UP APPARATUS IN CAMERA USABLE TOGETHER WITH A FILM MAGAZINE DEVICE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,683

Claims priority, application Japan, Mar. 27, 1981, 56-44120

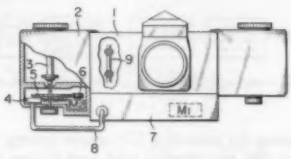
Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173.11 **7 Claims**

1. In a photographing camera system comprising film feed means, a first driving source for driving said feed means, means for taking up film from said feed means, second driving means for driving said take-up means, power supply means for said first and second driving sources, means for connecting said first and second driving means to said power supply means at substantially the same time, and first control means for disconnecting said first driving source from said power supply means when a definite amount of said film has been fed by said feed means, the improvement comprising:

second control means for disconnecting said second driving source from said power supply means before said first driving source is disconnected from said power supply means;

said second control means including timer circuit means which generates an output upon elapse of a delay time



changing in approximation to a function as represented by a rectangular hyperbola, relative to change in an output voltage of said power supply means, after said second driving source has been connected to said power supply means.

4,451,151

OPTICAL DEVICE FOR SUSTAINING A RADIANT ENERGY PULSE WHICH CIRCULATES WITHIN A MONOMODE WAVE GUIDE A GYROMETER AND A HYDROPHONE EQUIPPED WITH SAID OPTICAL DEVICE

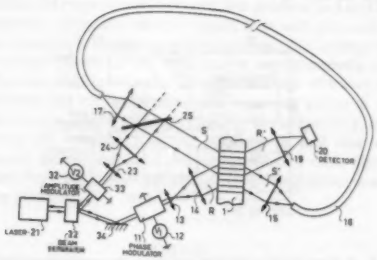
Jean-Pierre Huignard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 23, 1982, Ser. No. 351,403

Claims priority, application France, Feb. 27, 1981, 81 03989

Int. Cl.³ G01B *9/02;* **G02B** *5/14;* **G01C** *19/58*

U.S. Cl. 356—345 **12 Claims**



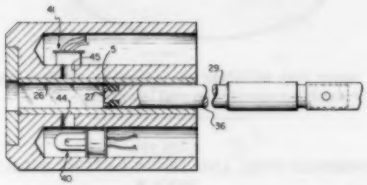
1. An optical device for sustaining a radiant energy pulse which circulates within a monomode waveguide, said device being constituted by a monomode optical waveguide in which is circulated a first wave consisting of a radiant energy pulse produced by a coherent source, optical connecting means being optically coupled to the end faces of said waveguide in order to form a circulation loop, wherein said optical connecting means consist of an interaction medium in which a phase grating has been photoinduced by the interference of two beams produced by said coherent source, said medium being coupled to the two end faces of said waveguide through the intermediary of optical focusing means, the energy of a pumping wave being transferred to said first wave via said medium and said pumping wave being derived from said coherent source, said energy being sufficient to sustain the radiant energy pulse which circulates within said loop.

4,451,152

METHOD FOR MEASURING THE RADIATION TRANSMITTING PROPERTIES OF A FLUID

George J. Topol, Gaithersburg, and Chadwick L. Trent, College Park, both of Md., assignors to Monitek, Inc., Hayward, Calif.

Continuation of Ser. No. 254,891, Apr. 16, 1981, abandoned, which is a continuation of Ser. No. 709,923, Aug. 18, 1976, abandoned. This application Mar. 7, 1983, Ser. No. 457,141
Int. Cl.³ G01N *21/03, 21/15*
U.S. Cl. 356—440 1 Claim



1. The method of sampling and examining the optical radiation transmitting properties of a fluid contained in a large volume of fluid comprising the steps of:

communicating the large volume of fluid with a sample chamber which has at least a pair of aligned optically transparent wall portions forming windows through which the optical radiation can pass through the fluid;

selecting a piston for the sample chamber, for drawing a fluid sample from the large volume of fluid into the sample chamber, which has an external diameter smaller than the internal diameter of the sample chamber to form a separation between the piston wall and the sample chamber wall sufficiently larger to insure lack of contact between the piston and the sample chamber to prevent scratching;

passing optical radiation from a source through the fluid sample to a detector for determining the optical radiation transmitting properties; and

fluid tightly sealing one end of the movable piston to the internal wall of the sample chamber with a seal which is shaped and dimensioned to also wipe the windows of the sample chamber without scratching by forming the seal with a main body portion which circumscribes the piston in sealing contact therewith but which is spaced apart from the sample chamber wall to avoid scratching that wall with debris in the fluid sample and with a structural frustoconical skirt integral with and extending outwardly from the main body portion and terminating the skirt in a flat forward end portion which is substantially at right angles to the center line of the piston and which has an external diameter at the outermost edge of the end portion slightly greater than the internal diameter of the sample chamber so that the outermost edge of the end portion seals against the sample chamber wall and the flat forward end portion is partially deformed by the sample chamber to inwardly and rearwardly taper the flat forward end portion to wipe the debris from the wall and to cause the debris to fall away from the wall inwardly when expelling the fluid sample from the sample chamber.

4,451,153

APPARATUS FOR BLENDING AND DISPENSING A MIXTURE OF ASPHALT EMULSION AND SAND

Denny F. Warnock, 6100 W. Stonehedge, Greenfield, Wis. 53220

Filed Jul. 6, 1981, Ser. No. 280,319
Int. Cl.³ B28C *5/38*
U.S. Cl. 366—13 1 Claim

1. Apparatus for blending and dispensing a mixture of liquid asphalt emulsion and sand comprising:

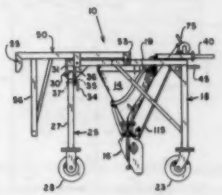
a mobile support including a first framework, a frame portion pivotably connected to said first framework for engagement with a pivotable dump body of a truck whereby said apparatus can be automatically mounted on said truck in raised position for road transport when said dump body is swung from tilted to horizontal position;

ground engaging wheels mounted on said first framework;

a second framework movably mounted on said first framework to enable manual adjustment;

a sand hopper mounted on said second framework and comprising a sand outlet port;

a blending and dispensing device mounted on said second framework below said sand hopper and comprising a housing including a chamber having a rotatable impeller therein and a sand inlet port, an emulsion inlet port, a gas inlet port and a mixture outlet port, each port communicating with said chamber;



valve means for controlling sand flow to said sand inlet port;

valve means for controlling emulsion flow to said emulsion port;

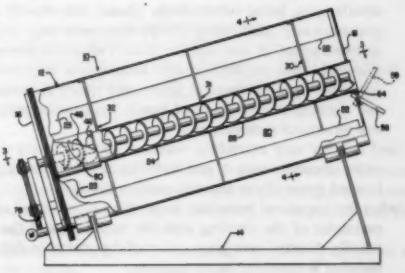
and a motor mounted on said device for driving said impeller.

4,451,154

MIXING DEVICE

James Zimmerman, P. O. Box 444A, New Holland, Pa. 17557

Filed Sep. 10, 1981, Ser. No. 300,905
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—186 11 Claims



1. A mixing device for forage or similar product, said device including:

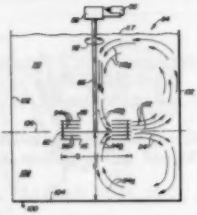
a rotatably mounted, inclined mixing chamber having a closed rear axial end lower than an open forward axial end, said chamber including an axially extending peripheral mixing zone between said rear and forward ends;

substantially linear mixing vanes extending forwardly from adjacent the rear end of the mixing zone for tumbling product when the chamber is rotated; an axially extending tubular housing within the mixing chamber for separating the peripheral mixing zone from a rotatably mounted axially extending auger within said housing, said auger communicating with the rear axial end of the mixing zone through a rear opening in said housing for receiving product from said mixing zone and feeding it toward and out of a forward axial end of said housing.

4,451,155
MIXING DEVICE

Richard B. Weber; George M. Wilfley, both of Denver, and George M. Wilfley, Castle Rock, all of Colo., assignors to A. R. Wilfley and Sons, Inc., Denver, Colo.

Filed Jan. 20, 1983, Ser. No. 459,344
Int. Cl.³ B01F 7/26
U.S. Cl. 366—265 14 Claims



1. A mixer for mixing a body of receiving liquid with solids, liquids or gases introduced therein, which comprises:

(a) a rotatable shaft;

(b) a thin disk-like member mounted for rotation of said rotatable shaft perpendicular to the axis of rotation thereof, the ratio of the overall diameter of said member to the maximum thickness thereof being at least about 32:1,

each of the upper and lower surfaces of said disk-like member being substantially planar and smooth from one edge portion of the opposite edge portion and being free of any impeller blades mounted thereon;

(c) at least one thin annular ring mounted on said disk-like member spaced from, parallel to, and concentric with the disk-like member, the ratio of the overall diameter of said annular ring to the maximum thickness thereof being at least about 32:1, said annular ring having a substantially circular inner opening,

each of the upper and lower surfaces of said at least one annular ring being substantially planar and smooth from one outer edge portion to the opposite outer edge portion and being free of any impeller blades mounted thereon,

the flow of liquid perpendicular to said annular ring through the inner opening thereof, when said mixer is immersed and rotating in said body of liquid, being unimpeded by any structural member, and

said annular ring extending outward approximately to the outer circumference of said disk-like member from a point located generally in the mid-portion thereof,

whereby improved boundary layer flow is provided at the perimeter of the rotating disk-like member, and the outwardly directed pumping action of the rotatable disk-like member is rendered more uniform.

4,451,156
FRYING PAN LID

Gerd Kloppsteck, Arnsberg, Fed. Rep. of Germany, assignor to Heinrich Berndes GmbH, Arnsberg, Fed. Rep. of Germany

Filed Oct. 8, 1981, Ser. No. 309,856
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 8027696
Int. Cl.³ G04B 47/00; G04F 3/00
U.S. Cl. 368—10 7 Claims

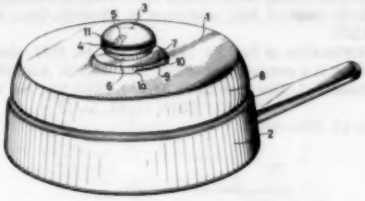
1. A frying pan lid comprising:

(a) a cover plate having a depending peripheral rim portion shaped to fit the top of a frying pan;

(b) a retaining knob secured centrically on top of said cover plate and formed as a housing; and

(c) a short-time bell accommodated in said housing;

(d) said housing comprising an upper cup and a lower cup, said lower cup including an indicating element and said

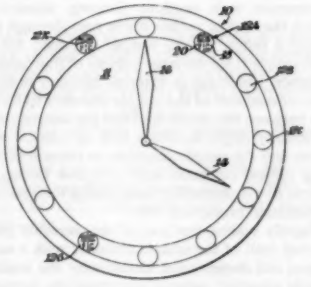


upper cup including an indicating window and being rotatably connected to said lower cup.

4,451,157
COMBINED TIME AND TEMPERATURE INDICATING DEVICE

James D. Reap, 810 Fowler Ave., Berwick, Pa. 18603

Filed May 13, 1982, Ser. No. 377,818
Int. Cl.³ G04B 47/06
U.S. Cl. 368—11 3 Claims



1. Combined time and ambient temperature indicating device whereby the temperature, in centrigrade and fahrenheit degrees, for each hour is displayed in visual association with the indication of the hour or part thereof comprising a casing having enclosed therein a clock mechanism and having a watch display face on which hourly time indicator factors are located in a circular visual pattern and in relation to means driven by the clock mechanism and independent liquid crystal temperature indicators placed on said display face at each time indicator factor so that for each hour position the surrounding ambient temperature will be displayed whereby a visual glance at the face to determine the time will enable a person to determine the temperature at such time.

4,451,158
COUNTDOWN TIMER

Stephen Selwyn, Queens, N.Y., and William P. Ketcham, 47 Sinawoy Rd., Cos Cob, Conn. 06807, assignors to William P. Ketcham, Cos Cob, Conn.

Filed Jan. 20, 1983, Ser. No. 459,371
Int. Cl.³ G04B 21/08; G04C 21/14
U.S. Cl. 368—63 9 Claims

1. A minaturized countdown timer comprising

(a) central processor unit means for counting down a selectible length of time to a zero time datum;

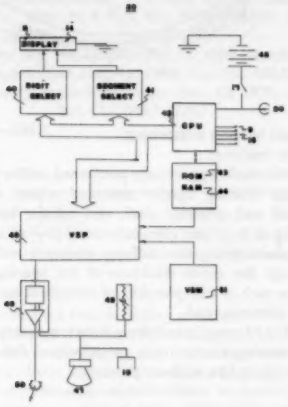
(b) LCD means for continuously displaying a digital readout of time remaining until said predetermined zero time datum;

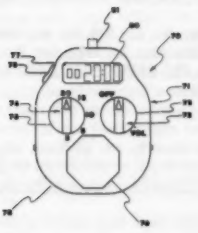
(c) voice synthesizer processor means for generating elec-

tronic signals corresponding to the digital readout at pre-programmed specific intervals;

(d) loudspeaker means for transducing said electronic signals into audible sounds corresponding to said displayed digital readouts of time remaining at said pre-programmed specific intervals;

(e) recall means for continually, without pause, recycling a predetermined recall time for countdown to said zero time datum upon the expiration of counted down time;





(f) processing means for monitoring the number of cycles said recall means and for continuously displaying the current number of said recall cycle on said LCD means;

(g) intermittent actuating means for activating said voice synthesizing processor means for synthesizing spoken time announcements on the whole minute throughout the countdown; at 15 second intervals of a pre-determined penultimate portion of the countdown; and at each second of the final portion of the countdown.

4,451,159

ELECTRONIC WATCH

Mitsunori Tanaka, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

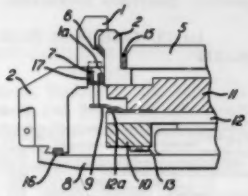
Filed Feb. 16, 1982, Ser. No. 349,382

Claims priority, application Japan, Mar. 6, 1981, 56-32071

Int. Cl.³ G04C *17/00*

U.S. Cl. 368—69 **18 Claims**

1. In an electronic watch operable in a plurality of modes: a watchcase body; a dial rotatably mounted on said case body; a plurality of camming portions provided on said dial and disposed in a circular pattern concentric with said dial; a circuit board within said case body; a plurality of switch terminal patterns deposited on an outer peripheral portion of said circuit board and being disposed in a circular pattern concentric with said dial; means including a plurality of reciprocable rods selectively engageable with the camming portions on the dial and positioned at respective ones of said switch terminal patterns to undergo reciprocal movement for selectively actuating said switch terminal patterns under the control of respective



ones of the camming portions on the dial in accordance with the stepwise rotation of the dial; and circuitry connected to said switch terminal patterns for producing a different mode recalling signal in response to a different combination of said actuated switch terminal patterns.

4,451,160

WATCH WITH A PUSH BUTTON

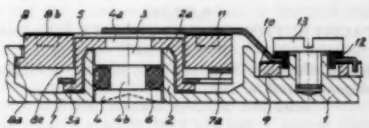
Josef Fluck, Granges, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Switzerland

Filed Sep. 24, 1981, Ser. No. 305,090

Claims priority, application Switzerland, Oct. 10, 1980, 7567/80

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—290 **9 Claims**



1. In a watch of the type having a relatively wide dimension defining the plane of the watch and a relatively thin dimension substantially perpendicular to the plane of the watch, the improvement of

a casing having a wall substantially parallel to the plane of the watch,

a re-entrant tube fixed to said wall of the casing and extending into the casing substantially perpendicular to said wall and plane of the watch, and terminating within said casing at an inside end,

a push-button comprising a stem member and a cylindrical cap member said stem member being slidably mounted in the tube and having an outer end adapted to receive contact pressure from the user of the watch, and an inner end, the distance between the outer and inner ends of the stem member defining the thickness of the stem member, said cylindrical cap member being fixed at one end to the inner end of the stem member and telescoping over said inside end of said tube, and

a return spring acting against the other end of the cylindrical cap member to bias the push-button outwardly, said return spring being coaxial with and contained entirely between the outer and ends of the stem member.

4,451,161

MOVEMENT FOR AN ELECTRONIC WATCH WITH ANALOGUE DISPLAY

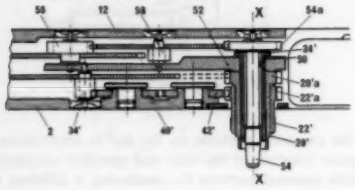
Jacques Müller, Reconvilier, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Switzerland

Filed Apr. 24, 1981, Ser. No. 257,278

Claims priority, application Switzerland, Apr. 25, 1980, 3193/80

Int. Cl.³ G04B *19/02, 29/00*

U.S. Cl. 368—220 2 Claims



1. A movement for an electronic watch provided with at least two hands comprising:

a motor;

a cell for supplying said motor;

a first arbor for carrying a minute hand and comprising a single toothed pinion, integral with said first arbor;

a second arbor, coaxial to said first arbor, for carrying an hour hand and comprising a single toothed pinion, integral with said second arbor, said two arbors being adjacent and without overlapping with said cell;

a gear train for connecting said motor to said pinions, comprising a minute wheel and an hour pinion, rigidly joined one to the other, to form a single piece, and two idler wheels, at least one idler wheel gearing with one of said pinions and the other wheel gearing with said single piece.

4,451,162

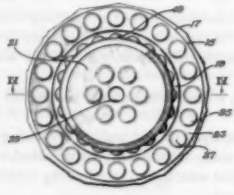
SPACED BUTTON THRUST SURFACE FOR EARTH BORING BIT

William L. Shepherd, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 18, 1982, Ser. No. 389,782

Int. Cl.³ F16C *17/04*

U.S. Cl. 384—95 4 Claims



1. In an earth boring bit having a body with a depending bearing pin, a cutter having an axial cavity rotatably receiving the bearing pin, the bit having passage means for circulating air through spaces provided between the cutter and bearing pin, the bearing pin having at least one thrust surface perpendicular to the axis of the bearing pin that slidingly engages a thrust surface formed inside the cavity, at least one of the thrust surfaces comprising:

a plurality of wear resistant tungsten carbide buttons interferingly pressed into mating holes formed in supporting metal, protruding therefrom, and engaging the opposite thrust surface in sliding contact.

4,451,163

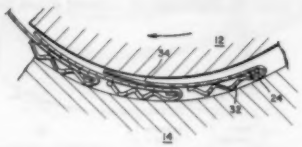
FOIL BEARING MOUNTING CARRIER

Glaser, Jerry, Playa del Rey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 1, 1982, Ser. No. 394,077

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—106 18 Claims



1. A fluid bearing comprising:

a tubular bushing;

a rotatable shaft supportively positioned within said bushing;

a tubular bearing carrier mounted within said bushing around said rotatable shaft, said tubular bearing carrier having at least one circumferential row of a plurality of compliant spring-like stiffener elements and an opening through the entire thickness of the bearing carrier between each of said plurality of compliant spring-like stiffener elements; and

a plurality of compliant hairpin foils removably disposed on said bearing carrier with an individual foil mounted on each spring-like stiffener element.

4,451,164

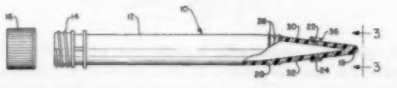
DISPENSING CONTAINER

James E. Roberts, Jr., 1825 Washington Blvd., NW., Canton, Ohio 44709

Continuation of Ser. No. 168,508, Jul. 14, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,303

Int. Cl.³ B43M *11/06;* A46B *11/04*

U.S. Cl. 400—196 4 Claims



1. A dish scrubber comprising:

a hollow handle having one closed end, one opened end, and closure for such opened end, said handle having a plurality of small area apertures in its wall adjacent said closed end;

said handle closed end portion being formed by a pair of opposed, tapered flat side portions defining a blunt point at such closed end;

a porous sponge body surrounding said closed end of said handle and extending up along said handle beyond said apertures some distance from said closed end; and

an abrasive fibrous surface layer on said porous sponge body and extending over at least said pair of opposed tapered side portions of said handle closed end and said said sponge body to form a wear-resistant layer on the dish scrubber which is adapted to receive and retain a liquid detergent in said handle but to release a detergent through said apertures on motion of the scrubber, characterized in that said liquid is retained in said handle closed end portion and in said handle opened end portion, said plurality of apertures being formed in said flat side portions and are horizontally aligned perpendicular to the direction of gravity in the normal position of use of the dish scrubber, and a circular external raised flange is formed on said wall around said apertures but spaced in the plane of the wall

from said apertures to prevent said sponge body from contacting said apertures.

4,451,165

INK RIBBON FOLDING MECHANISM FOR A PRINTING APPARATUS

Toshiharu Fudatsuji; Tsutomu Imagi, and Hiroshi Miura, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

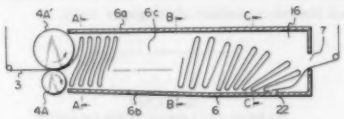
PCT No. PCT/JP80/00304, 371 Date Jul. 31, 1981, 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01685, PCT Pub. Date Jun. 25, 1981

Continuation of Ser. No. 287,751, Jul. 31, 1981, abandoned. This PCT application Dec. 11, 1980, Ser. No. 504,090

Claims priority, application Japan, Dec. 12, 1979, 54-161033

Int. Cl.³ B41J *32/02*

U.S. Cl. 400—196.1 **3 Claims**



1. An improved ink ribbon folding mechanism for a printing apparatus of the type wherein a ribbon case provided with side walls and a ribbon supporting surface at the bottom thereof, which define a ribbon supporting portion, and with an inlet and an outlet at opposite ends of said ribbon supporting portion, said ribbon supporting portion being adapted for temporarily storing a portion of an endless loop of ink ribbon that is withdrawn from the outlet of the ribbon case and circulated through a printing station where one side of the ink ribbon is subjected to collision with type before the ink ribbon is returned to the ribbon case through the inlet thereof, and a pair of feed rollers having parallel axes of rotation are disposed adjacent each other at said inlet of said ribbon case so that the ink ribbon returning to the ribbon case is pinched between said feed rollers and fed into said ribbon storing portion alternately along the peripheries of the feed rollers so as to be folded regularly by lengths reaching the opposite side walls of the ribbon case and to be forwarded in the ribbon storing portion to the outlet of the ribbon case, wherein the improvement comprises:

(a) that the point at which said feed rollers pinch the ink ribbon is located in a biased position with respect to a line running along the center between the opposite side walls of the ribbon case, on the side of the ribbon case that is the closest to the surface of the ink ribbon which is not subjected to collision with the type;

(b) that the feed roller which is in contact with the surface of the ink ribbon subjected to collision with the type has a larger diameter than that of the other feed roller;

(c) that the outermost portion of said other feed roller, said outermost portion being opposite to said point of pinching of the ink ribbon with respect to the axis of said other feed roller, is positioned further from said center line than the distance from said center line to the inner surface of the side wall of the ribbon case that is closest to the surface of the ink ribbon which is not subjected to collision with the type;

(d) that said feed roller which is in contact with the surface of the ink ribbon subjected to collision with the type protrudes on both sides of said other roller, so that lines drawn perpendicular to the center line and tangent to said feed roller which is in contact with the surface of the ink ribbon subjected to collision with the type do not pass through said other roller; and

(e) that said ribbon supporting surface of the ink ribbon case has an end region adjacent the inlet of the ribbon case which is substantially horizontal and has an end region adjacent the outlet of the ribbon case which is inclined with respect to the horizontal, with the intermediate region between said end regions being twisted about said center line and with the angle of inclination between the horizontal and the ribbon supporting surface increasing from one end region to the other so as to connect said end regions.

4,451,166

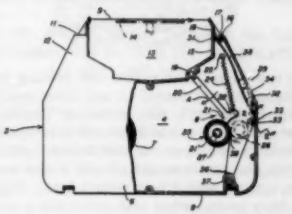
INKED RIBBON CARTRIDGE WITH RIBBON DRAG DEVICE

Thomas E. Frechette, Windsor Locks, Conn., and Helge H. Reuter, Nuremberg, Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buround Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,343

Int. Cl.³ B41J *33/28*

U.S. Cl. 400—208 **6 Claims**



1. In a ribbon cartridge for a typewriter or like machine having a housing for ribbon supply and take-up spools and having spaced outwardly extending arms for guiding ribbon drawn by take-up means from a supply spool out of an exit aperture across a gap defined by said spaced outwardly extending arms and into an entry aperture,

said take-up means including a drive wheel and a take-up spool rotatably mounted in said housing and biased toward one another to maintain a nip with the periphery of said spool and said drive wheel in frictional engagement,

means for guiding ribbon between said entry aperture and the nip of said take-up spool and wheel including spaced abutments and a flexible member anchored in said cartridge and extending along a side wall of said cartridge, said flexible member having a length greater than the distance between said abutments and anchored to at least one of said abutments whereby it can be flexed toward said side wall, and

a resilient pad secured to and biased by said flexible member against said cartridge side wall to apply drag to ribbon passing between said pad and cartridge side wall to tension said ribbon subsequent to its passage through said entry aperture and in advance of its entry into the nip of said take-up spool and drive wheel.

4,451,167

PRINTING DEVICE WITH SWING-AWAY CUTTER ARRANGEMENT

Takao Honma; Nobuaki Matsukura; Keisuke Murakami, and Susumu Matsuda, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,156

Claims priority, application Japan, Jun. 30, 1981, 56-100468

Int. Cl.³ B41J *11/70*

U.S. Cl. 400—621 **8 Claims**

1. A printing device with a cutter arrangement comprising:

a printing body including a platen over which a printing medium is movable during a printing operation;

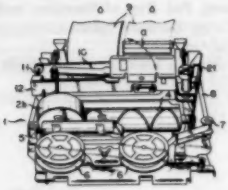
an ink ribbon located along said platen;

a printing head facing said ink ribbon and said platen;

means for moving the printing head along said platen during a printing operation;

a cutter unit having one end rotatably mounted on said printing body and which is rotatable between an open position whereat said printing head is exposed and a closed position whereat said cutter unit covers at least a part of said printing head;

said cutter unit including a driven system located within said cutter unit, said driven system including a cutter means and an actuation transmitting means, both mounted within said cutter unit;



a drive system mounted within said printing body; and

an engaging lever mounted on said drive system and which is engageable with said actuation transmitting means, when said cutter unit is in its said closed position, to couple said drive system to said driven system to thereby operate said cutter means of said driven system via said drive system, said driven system being disengaged from said drive system when said cutter unit is in its open position.

4,451,168

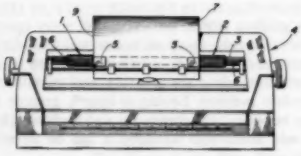
BOTTOM LINE WORK PIECE HOLDERS

Cleo Greenhaw, 1201 Princeton, and Marvin Smotone, 1213 Brentwood Dr., both of Ponca City, Okla. 74601

Filed Jul. 7, 1982, Ser. No. 395,915

Int. Cl.³ B41J *13/10*

U.S. Cl. 400—623 **2 Claims**



1. Workpiece holders for holding a workpiece in proper position in a typewriter having a paper scale, the paper scale having a flat outer surface and a flat upper surface which is generally perpendicular to the flat outer surface, the flat outer surface and the flat upper surface having a cross section corresponding to the outer surfaces of an inverted L, the workpiece being held in proper position for typing to the bottom line of the workpiece without side slippage near the bottom of the workpiece, the workpiece holders comprising:

a left workpiece holder and a right workpiece holder, each workpiece holder having;

a body adapted for fixable, detachable, and slidable mounting flush with the outer surface of the paper scale of the typewriter, the body of the workpiece holder having an inner surface corresponding to the general cross sectional shape of an inverted J adapted for fitting over the flat outer surface and the flat upper surface of the paper scale, the inner surface of the body being comprised of a magnetic material for easily fixable, slidable, and detachable mounting on the outer surface of the paper scale, and each workpiece holder also having an inner member, upon mounting, positioned parallel to the outer surface of the paper and at a distance out from the outer surface of the paper scale sufficient that free movement of the workpiece between the member and the outer surface of the paper scale is possible, characterized further in that:

the outer portion of the body member is molded of a plastic, the inner member of each workpiece is comprised of a transparent meaterial, the inner member is adhered to an inner elongated portion of the inverted J cross section over the horizontal length of the body and extending integrally to form the inner member, and cross sectionally inner of the J cross-section a magnetic material is adhered for mounting the workpiece holder fixably, detachably, and slidably flush with the outer surface of the paper scale of the typewriter, the magnetic material being of sufficient thickness to maintain the inner member in a position parallel to the outer surface of the scale and at a suitable distance out from the outer surface of the paper scale for free movement of the workpiece between the inner member and the outer surface of the paper scale.

4,451,169

PAPER LOADING APPARATUS

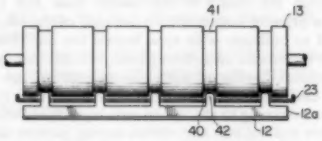
Michio Umezawa, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 9, 1981, Ser. No. 310,288

Claims priority, application Japan, Oct. 14, 1980, 55-144140; Oct. 15, 1980, 55-144119

Int. Cl.³ B41J *13/28*

U.S. Cl. 400—631 **1 Claim**



1. A paper loading apparatus including a platen, a paper retaining roller and a stop claw having protuberances formed on its free end, the roller and stop claw being movable relative to the surface of the platen in mutually opposite directions, the platen being formed with a plurality of axially spaced annular grooves in its periphery aligned with said protuberances, paper to be loaded being inserted into the apparatus when the paper retaining roller is removed from the surface of the platen and the stop claw protuberances abut with the aligned grooves of the platen until the leading edge of the paper inserted bears against the stop claw protuberances to achieve parallelism of the paper with respect to the platen as the paper is positioned axially of the platen,

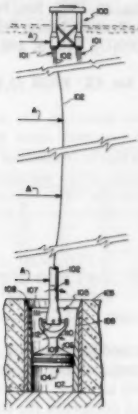
means moving the stop claw away from the platen when the paper retaining roller is brought into abutment against the surface of the platen; detection means for detecting the insertion of the paper into the apparatus, and motor means connected to said paper retaining roller and responsive to a signal from the detection means for automatically initiating the movement of the paper retaining roller and of the stop claw relative to the surface of the plate; the stop claw and the paper retaining roller being mechanically connected, the movement of the stop claw relative to the platen being responsive to the movement of the paper retaining roller relative to the platen, said motor means being one solenoid, the signal from the detection means energizing said solenoid to thereby move the paper retaining roller away from the platen and, through said connecting means, simultaneously cause the stop claw to move toward the platen.

4,451,170

APPARATUS FOR CONNECTING A TENSION MEMBER TO AN UNDER-WATER ANCHORING BASE

William S. Cowan, West University Place, Tex., assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 192,709, Oct. 1, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,812
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ F16D 3/00
U.S. Cl. 403—57 14 Claims



1. In apparatus for connecting an elongated tension element to a fixed underwater structure with the tension element extending generally downwardly to the underwater structure, the combination of

a male connector unit,

a female connector unit, and

connector means comprising

a transverse annular shoulder carried by one of the male and female connector units, and

generally annular stop means carried by the other of the male and female connector units,

the shoulder and stop means being in mutual engagement and preventing upward movement of the elongated tension element relative to the connector units,

one of the male and female connector units being connected to the elongated tension element,

the other of the male and female connector units being secured to the fixed underwater structure;

rigid generally tubular means having a bore wall portion and being secured to the fixed underwater structure in a position in which the bore wall portion is concentric with the connector and spaced above the connector means; and

flex joint means connected between the elongated tension element and the one of the male and female connector units which is connected thereto, the flex joint means comprising

a first flex joint member rigidly connected to said one of the male and female connector units,

a second flex joint member rigidly connected to the elongated tension element,

universal joint means interconnecting the first and second flex joint members and transmitting tension loads from one flex joint member to the other; and

rigid stop means including a generally annular outwardly directed stop surface surrounding and carried by the flex joint means in a location spaced substantially above the connector means,

the rigid stop means being rigidly carried by the flex joint means and preventing significant lateral movement of the rigid stop means relative to the flex joint means, and the annular stop surface being so closely embraced by the bore wall portion that lateral forces applied to the flex joint means by the tension element are transferred to the fixed underwater structure via direct engagement between the rigid stop means and the bore wall portion without occurrence of substantial relative movement between the shoulder and stop means of the connector means.

4,451,171

POLYAMIDE AS A PRIMER FOR USE WITH ASPHALTIC MEMBRANES

William E. Uffner, Newark, and Robert N. White, Etna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 205,032, Nov. 7, 1980, Pat. No. 4,362,586. This application May 10, 1982, Ser. No. 376,370
Int. Cl.³ E01C 5/22
U.S. Cl. 404—31 1 Claim

1. In a repaired cementitious road comprising a road substrate having a crack therein containing a crack filling material, a primer disposed on opposite surfaces of said road substrate adjacent said crack and an asphaltic membrane spanning said crack and being in contact with said primer on said opposite surfaces, the improvement wherein said primer is a polyamide having a softening point between about 99° C. to about 125° C. and a viscosity at 160° C. of about 6 to about 34 poise.

4,451,172

OPEN TOP DRAIN

Larry N. Lamphier, Hubbard, Ohio, and Walter A. Meyers, Bel Air, Md., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Continuation of Ser. No. 200,167, Oct. 10, 1980, abandoned, and Ser. No. 968,949, Dec. 13, 1978, abandoned. This application Mar. 10, 1982, Ser. No. 356,707
Int. Cl.³ E01F 5/00; E02B 11/00
U.S. Cl. 405—49 1 Claim

1. A culvert having a corrugated metal cylindrical wall, said wall having seams parallel to the corrugations and having a plurality of longitudinally spaced apart longitudinally elongated rectangular openings disposed at regular repeating intervals in a line along the top of said culvert for the entry of water, said openings being separated longitudinally from each other by curved portions of said corrugated metal cylindrical wall, each separating curved wall portion including at least one corrugation and a seam, the bottom and sides of said culvert wall being essentially free of openings, and a plurality of metal bar anchor members, each anchor member having a curved portion extending obliquely across one of said openings and secured to the bottom of a corrugation valley on either side of said opening and having two end portions projecting upwardly and outwardly away from the outer surface of the wall of said culvert.

4,451,173

STORAGE POND

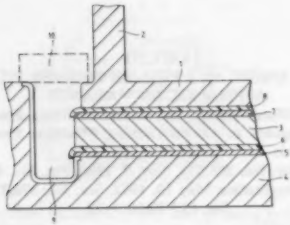
Eric Watson, Culcheth, and Eric Hunter, Leyland, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Jul. 9, 1982, Ser. No. 396,807

Claims priority, application United Kingdom, Aug. 13, 1981, 8124805

Int. Cl.³ B65D *25/24*

U.S. Cl. 405—53 4 Claims



1. An above ground storage pond for hazardous liquids comprising a support base, a floor on the base, upstanding side walls, a trench surrounding the floor and side walls, and upper and lower impervious members in the base extending uninterrupted beneath the floor and side walls to emerge into the trench whereby any leakage through the floor and side walls is directed into the trench.

4,451,174

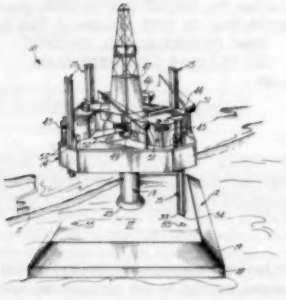
MONOPOD JACKUP DRILLING SYSTEM

Sherman B. Wetmore, Westminster, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Feb. 7, 1983, Ser. No. 464,481

Int. Cl.³ E21B *15/02;* E02B *17/02*

U.S. Cl. 405—196 21 Claims



1. An offshore platform structure comprising a mat base adapted to engage the surface of and be supported by a subsea soil layer, a closed-surface pylon affixed at a lower end thereof to the base centrally thereof and extending to an upper end spaced from the base, a jackable deck unit having therethrough a central opening for passage of the pylon therethrough, securing means releasably engageable between the deck unit and the pylon adjacent the upper end of the pylon for securing the deck unit to the pylon in spaced relation to the base, a plurality of jacking legs carried by the deck unit in spaced relation to the central opening, and jacking means cooperable between the legs and the deck unit and operable for jacking the deck unit relative to the base along the pylon in response to engagement of the leg lower ends with the base and for jacking the legs to an elevated position at the deck unit.

4,451,175

METHOD FOR IMPROVING SOFT GROUND BY SAND DRAIN METHOD AND CYLINDRICAL BAG FOR USE IN SAME

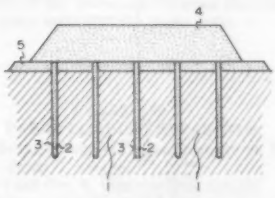
Hiromichi Yamashita, Tokyo; Yoshiharu Watari, Yokohama; Hideaki Mutsuro, Fukuoka, and Kenji Takagi, Funabashi, all of Japan, assignors to Teijin Limited and Penta-Ocean Construction Co., Ltd., both of Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,351

Claims priority, application Japan, Feb. 5, 1982, 57-14068[U]; Feb. 5, 1982, 57-14069[U]; Feb. 5, 1982, 57-14070[U]; Feb. 5, 1982, 57-14071[U]

Int. Cl.³ E02B *11/00*

U.S. Cl. 405—50 26 Claims



1. A sand drain method for improving soft ground having an undesirably high water content by imposing a load on the surface of said ground to cause removal of water via at least one sand drain, which comprises the steps of:

inserting a casing pipe into the soft ground followed by insertion of a cylindrical bag composed of a water-permeable material into the casing pipe, at least a part of said bag including means responsive to imposition of said load for increasing the diameter of said bag part;

constructing a sand drain by filling sand in the inserted cylindrical bag followed by drawing out the casing pipe, leaving the sand-filled cylindrical bag in the soft ground; and

imposing a load on the surface of the soft ground adjacent said sand drain to remove water through the sand drain and consolidate the soft ground, whereby the diameter of said bag part increases so that the sand drain does not act as a rigid pile and does not support a substantial part of the consolidation load, thus allowing free settlement of the soft ground.

4,451,176

APPARATUS FOR AND METHOD OF DRIVING TUNNELS

Günter Flocke, Lünen; Hans Jütte, Dortmund-Brechten; Klaus Linde; Winfried Klamke, both of Lünen, and Werner Hampel, Selm, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Continuation of Ser. No. 149,979, May 15, 1980, abandoned. This application Jul. 15, 1982, Ser. No. 398,681

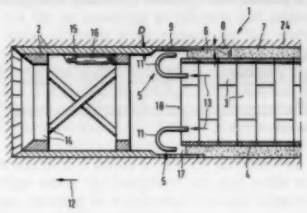
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921907

Int. Cl.³ E21D *9/06, 11/10*

U.S. Cl. 405—146 11 Claims

1. An apparatus for use in tunnel driving, comprising: an advanceable drive shield for supporting the forward region of a tunnel wall during excavation, formwork located rearwardly of the drive shield relative to the direction of the tunnel driving, the formwork being of multi-part construction and advanceable to follow up the drive shield by removal of a rear part and re-siting of the rear part at the front end of the formwork, the formwork cooperating with the tunnel wall to define an annular space with an open front region facing said drive

shield for receiving concrete used to create a lining for the tunnel wall, and movable spray means for rearwardly spraying concrete through and around said open front region into said



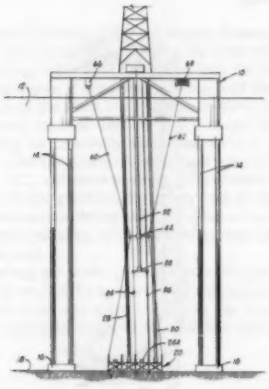
space to fill said space and to create said lining, said front region remaining open while concrete is sprayed into said space to accommodate movement of said spray means, thereby achieving an even distribution of the sprayed concrete.

4,451,177

GUIDELINE SYSTEM FOR POSITIONING SUBSEA EQUIPMENT

Riley G. Goldsmith, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 8, 1982, Ser. No. 346,854
Int. Cl.³ E02B *17/00*; B63B *35/44*
U.S. Cl. 405—195 **26 Claims**



1. A method of laterally positioning a second item of subsea equipment adjacent an existing first item of subsea equipment while lowering said second item from a surface structure toward a floor of a body of water, said method comprising:

providing at least two guidelines between said surface structure and a fixed structure located within said body of water below said surface structure;

slidably connecting said second item to said guidelines so that said guidlines are outwardly splayed in at least one direction above or below a point of sliding engagement of said guidelines with said second item;

lowering said second item from said surface structure so that said second item slides downward along said splayed guidelines; and

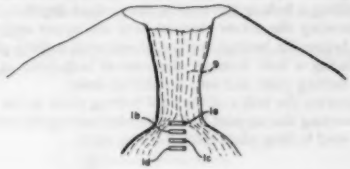
tensioning said splayed guidelines against the surface structure and the fixed structure to exert a lateral force on said second item.

4,451,178

METHOD FOR DISPERSING OR ARRESTING LAVA FLOW

Joseph Sperrazza, Aberdeen; James C. C. Liu, Bel Air, both of Md., and Wilfred E. Baker, San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 21, 1981, Ser. No. 285,889
Int. Cl.³ E02D *3/00*; A62C *37/00*
U.S. Cl. 405—258 **16 Claims**



1. The method of diverting lava flow including the steps of:

(a) positioning for filling, a high pressure vessel explosive under extremely high pressure,

(b) at least partially filling said vessel with a nonflammable composition, liquid at normal temperatures and convertible to gas under high temperature, allowing room within said vessel for expansion of said composition if frozen,

(c) tightly sealing said vessel to prevent loss of said composition,

(d) positioning said vessel in a volcanic region, in a specific predetermined locale in the normal expected channel of a lava flow,

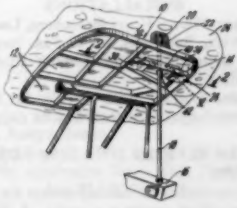
(e) whereby when a lava flow occurs in said volcanic region and flows over said vessel, said vessel will heat up to temperatures of at least 1000° F. or more causing said composition to be heated and converted into gas thereby presurrizing said vessel to a desired exploding pressure, causing said vessel to explode with sufficient force so as to divert said lava flow from its normal channel into a new channel and away from a predetermined geographical area.

4,451,179

METHOD AND APPARATUS FOR AFFIXING A ROOF BOLTING PLATE TO A MINE ROOF

Arnold B. Bower, Jr., Bristol, Va., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 10, 1979, Ser. No. 102,279
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **5 Claims**



5. A method of affixing a roof bolting plate having a central bolt hole to a roof using a roof bolting drill having a driver element, with the roof bolting drill further including a support frame having a plurality of supporting members having a generally trough-like configuration including a flange member extending transversely therein and disposed intermediate the length of said members such that said roof bolting plate is prevented from shifting longitudinally during a drilling opera-

tion, said support members being positioned such that when a roof bolting plate is slidably received within said supporting members, the central bolt hole of the roof bolting plate is aligned with the driver element of the roof bolting drill, said method comprising the steps of:

mounting a roof bolting plate between said supporting members on said support frame;

raising said support frame until the upper surface of the roof bolting plate abuts the roof;

raising the driver element such that it passes through and is guided by the central bolt hole of said roof bolting plate;

drilling a hole in the roof to the desired depth;

lowering the driver element until the upper end thereof is below the bottom surface of said roof bolting plate;

placing a bolt through the central bolt hole of the roof bolting plate and into the drilled hole;

securing the bolt and the roof bolting plate to the roof; and

lowering the support frame thereby leaving the bolt and the roof bolting plate affixed to the roof.

4,451,180

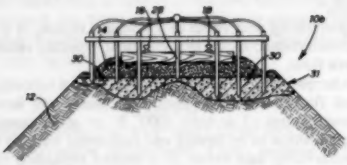
METHOD FOR RESTRUCTURING RAILWAY ROADBEDS

Henry H. Duval, 3944 Boca Bay Dr., Dallas, Tex. 75234

Continuation of Ser. No. 904,337, May 9, 1978, abandoned. This application Dec. 17, 1981, Ser. No. 331,836

Int. Cl.³ E02D *3/14*

U.S. Cl. 405—269 **1 Claim**



1. A method for restructuring a railway roadbed comprising the steps of:

(a) removing ballast from beneath the rails and crossties of said roadbed;

(b) admixing said ballast with a structural slurry;

(c) depositing said admixture beneath the rails and crossties of said roadbed to form a structured layer; and thereafter

(d) providing at least about 4 inches of ballast between said structured layer and said crossties.

4,451,181

CONTROL SYSTEMS FOR MINERAL MINING INSTALLATIONS

Thomas Trumper, Werne; Harry Rosenberg, Ludinghausen, and Walter Weirich, Dortmund, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

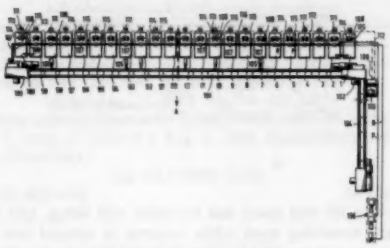
Filed Mar. 24, 1982, Ser. No. 361,182

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111875

Int. Cl.³ E21D *23/12;* **F15B** *11/20*

U.S. Cl. 405—302 **5 Claims**

1. In an electro-hydraulic control system for a mineral mining installation which employs a series of shiftable support units with associated hydraulic consumer appliances arranged side-by-side along a mine working: said system comprising pressure fluid feed and return lines, control means on each unit, each said control means including hydraulic valves and solenoid valves which serve to connect the appliances associated with the unit selectively to the feed and return lines and electronic control devices programmed to cause a predetermined sequence of operations to be performed affecting one or a group of units, and a remote control station linked to all the control means via a line for conveying electrical control signals; the improvement comprising selector switches are provided for the control means of the units, the selector switches being accessible for direct local actuation by an operator and arranged to permit said operator to initiate a sequence of automatic operations on any selected group composed of a number of units by actuating one of the selector switches which is associated with the control means of a support unit that is outside of and separated from the selected group by at least one intermediate unit.



4,451,182

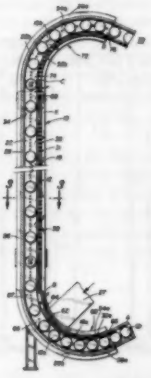
AIR TRANSPORT SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Filed Oct. 2, 1978, Ser. No. 947,441

Int. Cl.³ B65G *51/02*

U.S. Cl. 406—86 **12 Claims**



1. An articles transportation system for transporting a series of articles to provide a predetermined spacing therebetween comprising in combination:

an elongated article conveyor duct with an inlet and an outlet having side walls and end walls spaced apart a distance just sufficient to accommodate an article within the duct with a predetermined clearance between the article and the side and end walls;

a pair of guide rails positioned along the interior of the side walls to support the articles in predetermined spaced relation to the side walls;

a series of spaced downstream slanted jet openings along the length of the end wall;

a plenum chamber forming an air supply duct extending along the end walls in communication with said jet openings;

means for supplying air under pressure to the plenum cham-

ber for supplying jets of air via said jet openings to the article duct in a downstream direction;

exhaust opening means serially positioned along at least one of said side walls being of a size in relation to the jet openings and the amount of air introduced into the article duct via the jet openings to provide and maintain a positive static pressure with respect to the ambient atmosphere between articles in the article conveyor duct; and

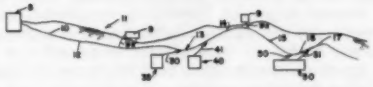
feeder means, for the articles to be transported, connected to the inlet of the article conveyor duct for feeding articles thereto at a selected uniform rate at spaced intervals, said feeder means comprising a length of duct connected to the inlet of the article conveyor duct having side walls and end walls with a series of spaced downstream slanted jet openings along the length of the end walls and a single exhaust opening in a side wall located adjacent the inlet end of the article conveyor duct.

4,451,183

METHOD AND ARRANGEMENT OF TRANSPORTING AGGREGATE, FRAGMENTED MATERIAL AND THE LIKE

Howard I. Lorenz, Houston, Tex., assignor to Pool Company, Houston, Tex.

Filed Apr. 2, 1981, Ser. No. 250,409
Int. Cl.³ B65G *53/00, 53/30*
U.S. Cl. 406—94 **2 Claims**



1. A method of transporting aggregate, fragmented material and the like in a pipeline comprising the steps of:

a. introducing foam under pressure into the pipeline along with aggregate, fragmented material and the like;

b. maintaining the foam at a pressure to move the aggregate, fragmented material and the like through the pipeline;

c. providing an upwardly extending section of pipeline at spaced intervals therealong, which upwardly extending section communicates at its lower end with the upstream portion of the pipeline, the upper end of such upwardly extending section being elevated relative to the lower end and communicating with the downstream portion of the pipeline; and

d. introducing gas under pressure into the pipeline adjacent the lower end of the upwardly extending section to regenerate the foam and assist in moving the foam and aggregate, fragmented material and the like through the pipeline.

4,451,184

APPARATUS AND METHOD FOR FEEDING PULVERIZED HYDROCARBONACEOUS SOLIDS INTO A HIGH PRESSURE REACTOR

David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 12, 1981, Ser. No. 272,951
Int. Cl.³ B65G *53/58*
U.S. Cl. 406—105 **5 Claims**

1. An apparatus for primary feeding of entrained particulate materials into a high pressure section of a fluidized bed reactor, comprising:

a first pressurization stage including:

a first venturi tube;

means for supplying the particulate material through an entry port of the first venturi tube;

a first motive gas nozzle in the entry port of the first venturi tube;

means for supplying pressurized motive gas to the first nozzle, the motive gas being mixed with the particulate material in the first venturi tube to form a first pressurized particulate material/motive gas mixture; and

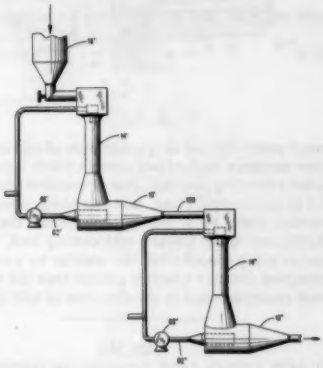
a first centrifugal means for separating a predetermined amount of the motive gas from the particulate material/motive gas mixture; and

a second pressurization stage, for receiving and further pressurizing the separated particulate material/motive gas mixture from the first centrifugal means, including:

a second venturi tube;

means for supplying the particulate material/motive gas mixture through an entry port of the second venturi tube;

a second motive gas nozzle in the entry port of the second venturi tube;



means for supplying pressurized motive gas to the second nozzle, the motive gas being mixed with the particulate material in the second venturi tube to form a second pressurized particulate material/motive gas mixture; and

second centrifugal means for separating a predetermined amount of the motive gas from the second particulate material/motive gas mixture to be introduced into the high pressure section of the reactor; and

means for recirculating the motive gas from the first and second centrifugal means to the first and second motive gas nozzles;

whereby the pressure of the particulate material introduced into the reactor is raised 50–150 psi by the feeding apparatus to a pressure greater than the pressure within the high pressure reactor.

4,451,185

BORING TOOL HOLDER WITH PROBES FOR MEASURING BORE

Tetsuro Yamakage, Anjo, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 21, 1981, Ser. No. 333,057
Claims priority, application Japan, Dec. 27, 1980, 55-185048
Int. Cl.³ B27C *9/02*
U.S. Cl. 408—2 **9 Claims**

1. A tool holder for use in a machine tool system including contact detection circuit means for detecting contact between said tool holder received in a tool spindle and a bore of a workpiece mounted on a work table when relative movement between said tool spindle and said work table is effected in a direction perpendicular to the axis of said tool spindle so as to measure the diameter of said bore after the machining of said bore, said tool holder comprising:

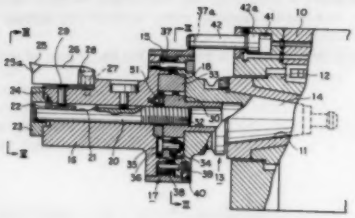
a shank receivable in said tool spindle;

a tool mounting shell fixed to said shank and including means for carrying a cutting tool thereon;

a pair of contact detection members respectively protruding from the outer surface of said tool mounting shell in opposite directional senses;

a first plane encompassing the axis of said tool mounting shell and a cutting edge of said cutting tool;

a second plane encompassing the axis of said tool mounting shell at right angles to said first plane; and



contact points formed at opposite ends of said contact detection members, each of said contact points being defined on a line extending perpendicular to said first plane and parallel to said second plane, said line being spaced from said second plane by a first predetermined distance in the directional sense toward said cutting tool, said contact points being spaced from one another by a second predetermined distance which is greater than the width of said tool mounting shell in the direction of said second plane.

4,451,186

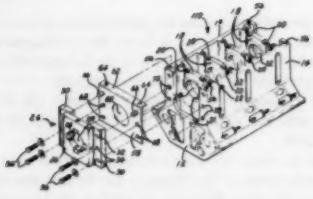
TOOL FOR USE IN LINE BORING OF DIESEL ENGINE BLOCKS

Charles L. Payne, 5404 NE. 56th Pl., Kansas City, Mo. 64119

Filed Apr. 6, 1981, Ser. No. 251,171

Int. Cl.³ B23B *41/12*

U.S. Cl. 408—54 **5 Claims**



1. In a tool for line boring a diesel engine block having a pair of locating holes adjacent an end thereof in a predetermined spatial relationship with substantially aligned bores which receive bearings for the crankshaft of the engine, said tool including a shaft and a cutting device carried on the shaft, the improvement comprising:

an adapter plate having a pair of pin elements projecting therefrom at locations to be fitted in said locating holes of the engine block, said adapter plate having a pair of spaced apart dowel members thereon;

a mounting pad having a pair of spaced apart holes therein at locations to be fitted on the respective dowel members in a manner to position said pad at a predetermined location on said end of the engine block;

means for securing said adapter plate and mounting pad to the engine block with said pin elements in said locating holes of the block and said holes fitted on said dowel members to position said pad at said predetermined location; and

an opening in said mounting pad having a center substantially aligned with the centers of the bores of the engine block when said mounting pad is at said predetermined location; and

a bearing received in said opening at a location aligned with the center of each bore, said bearing being adapted to rotatively support said shaft in extension through the center of each bore to permit rotation of said shaft for operation of the cutting device to cut damaged bores about aligned centers thereof.

4,451,187

MACHINE TOOL

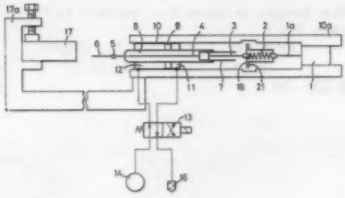
Michio Ishikawa, and Kiyoshi Sasaki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 10, 1982, Ser. No. 347,539

Claims priority, application Japan, Feb. 18, 1981, 56-23416

Int. Cl.³ B23C *9/00*; B23B *39/00*

U.S. Cl. 409—187 **18 Claims**



1. A machine tool comprising:

a frame;

a tool support mounted on the frame;

a tool carried by the tool support;

first drive means for effecting a relative linear movement between the tool support and a workpiece supported on the frame;

second drive means for rotating one of the tool and the workpiece relative to the other;

detecting means, disposed between the second drive means and said one rotated thereby, for detecting a load torque applied to the rotated one and producing a load signal responsive to a magnitude of the detected load torque;

a start switch for producing a start signal to actuate the second drive means; and

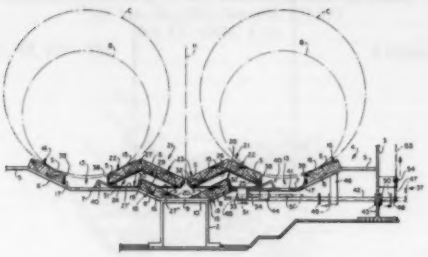
control means, connected to said first and second drive means, said torque detecting means and said start switch, for controlling said first and second drive means, said control means actuating said second drive means upon receipt of said start signal, calculating a variation in the detected load torque during the actuation of said second drive means, actuating said first drive means to effect said relative linear movement in a direction to cause contact of the tool with the workpiece when the calculated value of said variation has decreased down to a first value after the actuation of the second drive means, obtaining a cutting resistance being exerted on the tool by calculating a difference between a currently detected load torque and a load torque detected after the actuation of said first drive means and before said contact of the tool, and reversing the actuating direction of said first drive means to effect said relative linear movement in a direction to cause separation of the tool and the workpiece away from each other in the event said difference has exceeded a second value, whereby the reversal of said actuating direction is determined by the actual cutting resistance which is exactly calculated based on the total load torque minus the non-cutting load torque which has been substantially stabilized after its initial period of decrease.

4,451,188

COIL CAR WITH SHIFTABLE TROUGH ASSEMBLIES

Ryan M. Smith, Woodstock, and David A. Stoller, Sr., Dunwoody, both of Ga., assignors to Portec, Inc., Oak Brook, Ill.

Filed Dec. 9, 1981, Ser. No. 329,207
Int. Cl.³ B60P 7/12, 7/14; B61D 3/16
U.S. Cl. 410—42 15 Claims



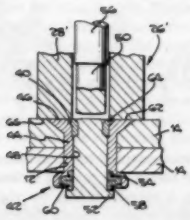
1. A vehicle for carrying cylindrical objects including, spaced apart longitudinal side sills defining a lading area therebetween, support means intermediate said side sills, a plurality of laterally spaced apart fixed trough members attached to said support means, at least a pair of removable shiftable trough assemblies selectively positionable above said support means at various lateral distances from the centerline of the vehicle, each said shiftable trough assembly defining an inverted "V" configuration, each said shiftable trough assembly when disposed at a first lateral position from the vehicle centerline forming with one of said fixed trough members a trough having its apex spaced from the vehicle centerline at a first distance, and each said shiftable trough assembly displaceable to a second lateral position relative the vehicle centerline to form with the respective same one of said fixed through members a trough having its apex spaced from the vehicle centerline at a second distance.

4,451,189

BULB RIVET

John D. Pratt, Rancho Cucamonga, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Filed Mar. 12, 1981, Ser. No. 242,892
Int. Cl.³ F16B 13/04
U.S. Cl. 411—34 15 Claims



1. In a blind rivet having a body with a head on one end and a longitudinal bore therethrough and a pull stem disposed in the bore with a head adapted for abutting the inner end of the body and upsetting it to form a bulb end as the pull stem is pulled toward the head of the body, the pull stem having a break groove to sever when the rivet is set, the improvement comprising:

a collapsible barrel concentrically disposed about the pull stem between the inner end of the body and the head of the pull stem, said collapsible barrel being structured to withstand a longitudinal compressive force sufficient to upset the body and form the desired bulb end thereon but being further structured to collapse upon further compression under force after the desired bulb end has been formed, said collapsible barrel not having progressive longitudinal strain hardening, and wherein

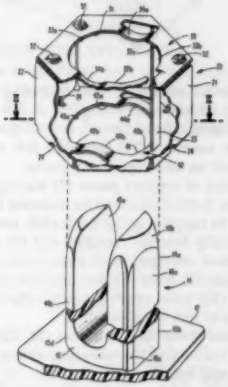
said collapsible barrel is cylindrical and has thickened sidewalls adjacent each end whereby said collapsing thereof occurs in the center portion thereof.

4,451,190

FASTENING ELEMENT AND A FASTENER ASSEMBLY USING THE SAME

Robert L. Bellamy, Jr., Richmond; James D. Bersot, Georgetown; Leonard Thomas K., Lexington, and Richard R. Muse, Georgetown, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/00877, § 371 Date Aug. 13, 1981, § 102(e) Date Aug. 13, 1981, PCT Pub. No. WO 83/00197, PCT Pub. Date Jan. 20, 1983
This PCT application filed Aug. 13, 1981, Ser. No. 301,992
Int. Cl.³ F16B 21/00
U.S. Cl. 411—337 6 Claims



1. A fastener assembly (10) for clamping at least one element, said fastener assembly being of a type having an aperture and post gouging portion, said fastener assembly characterized by:

a longitudinally extending post (11,70) including at least a pair of longitudinally extending recesses (14*a*,14*b*,72) therein;

said post (11,70) material having a first hardness;

a fastener element (20,60) for mating engagement with said post (11,70) to form said assembly (10), said fastener element (20,60) comprising a body portion (21,63) having means defining an aperture (31,41,66) therein dimensioned for sliding engagement with said post (11,70) when in a first orientation and for biting engagement with said post (11,70) when the orientation is changed by relative rotation between said fastener element (20,60) and said post (11,70);

said fastener element (20,60) including projections (32*a*,32*b*,42*a*,42*b*,62) extending inwardly and positioned for coactive engagement in said recesses (14*a*,14*b*,72) of said post (11,70) to permit sliding relative movement between said post (11,70) and said fastener element (20,60);

at least said projections (32*a*,32*b*,42*a*,42*b*,62) being of a second hardness greater than said first hardness whereby said projections (32*a*,32*b*,42*a*,42*b*,62) bite into said post (11,70) to inhibit separation of said fastener element (20,60) from said post (11,70) upon relative rotation from said first orientation, said projections (32*a*,32*b*,42*a*,42*b*,62) including a ramp (34*a*,34*b*,44*a*,44*b*,65) for effecting a wedging action between said fastener element (20,60) and said post (11,70).

4,451,191

STACKED FABRIC REMOVAL AND RE-LOCATING DEVICE

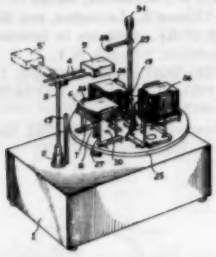
Giancarlo D. Torre, Biassono, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Apr. 30, 1982, Ser. No. 373,547

Claims priority, application Italy, Jun. 23, 1981, 22517 A/81

Int. Cl.³ B65H 1/14

U.S. Cl. 414—118 **1 Claim**



1. A device for removing and relocating pieces of flexible material from a stack comprising:

(a) a supporting frame (1);

(b) a plate member (25) mounted for rotatable indexing movement on said supporting frame;

(c) a plurality of support plates (7) having seats (10) on the underside thereof mounted for rotation in said plate member (25) to support stacks of flexible material;

(d) a vertically linearly movable rod (8) having the upper end thereof configured to mate with said seats (10) to move plate (7) from a lower position adjacent said plate member (25) to an upper position where removal of flexible material can be effected;

(e) upper and lower limit switches (21, 22) mounted on said frame (1) to control the maximum extent of vertical movement of said rod (8);

(f) horizontally directed photo-electric sensing means (19) mounted on said frame (1) to provide for vertical adjustment of said rod (8) as flexible pieces are removed from said plate (7);

(g) vertically directed photo-electric sensing means (28) mounted on said frame (1) for determining when all flexible pieces have been removed from said plate (7) so that said rod (8) will move to its lowermost position and said plate member (25) will rotate to bring a new plate (7) with flexible pieces into unloading position;

(h) a pick-up member (5) mounted on said supporting frame (1) and movable to a position overlying said plate (7);

(i) means for displacing said pick-up member (5) toward a stack of flexible pieces on said plate (7), a distance which is slightly greater than the distance which separates it from the upper surface of the stack; and

(j) means for displacing said pick-up member (5) in its raised position for releasing and relocating the flexible piece of material removed from the stack.

4,451,192

SILO UNLOADER

Jonathan G. Wood, Northbridge House, Chiddingfold, England

PCT No. PCT/GB80/00086, 371 Date Jan. 8, 1981, 102(e) Date Jan. 8, 1981, PCT Pub. No. WO80/02416, PCT Pub. Date Nov. 13, 1980

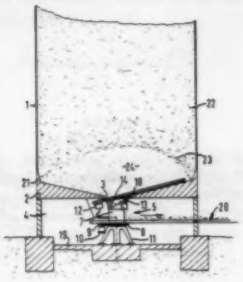
PCT Filed May 9, 1980, Ser. No. 229,600

Claims priority, application United Kingdom, May 9, 1979, 7916082

Int. Cl.³ B65G 65/42

U.S. Cl. 414—306 **11 Claims**

1. The combination of storage silo and a bottom unloader therefor, said silo having a base formed as a hopper provided with a substantially central discharge outlet, a chamber located below said base, said unloader being mounted in said chamber and arranged to project into the silo through the discharge outlet and comprising a sweep arm mounted for rotation in the hopper about a vertical axis centrally of the discharge outlet



and for vertical movement away from the surface of the hopper, means in said chamber for rotating the sweep arm about the vertical axis and means in said chamber disposed adjacent to the vertical axis for moving the sweep arm vertically and for maintaining said sweep arm spaced away from the surface of the hopper during operation thereof.

4,451,193

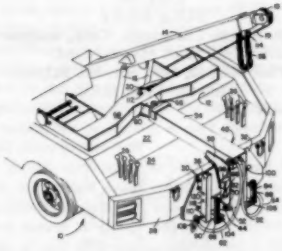
WHEEL LIFT APPARATUS

Fleming V. Cannon, Jr., Flintstone, Ga., and Frankie E. Casteel, Soddy Daisy, Tenn., assignors to Dover Corporation, Chattanooga, Tenn.

Filed Aug. 26, 1982, Ser. No. 411,604

Int. Cl.³ B60P 3/12

U.S. Cl. 414—563 **9 Claims**



1. A towing device adapted to be mounted at the rear of a towing vehicle for lifting and towing a disabled vehicle, said device comprising: a support means for rigidly securing said device on the towing vehicle; means defining a slideway carried by said support means; a gate journalled in said slideway for slidable movement relatively to said support means; a beam including extendible lifting means adapted to be placed beneath the disabled vehicle; means for pivotably mounting said beam on said gate for pivotable movement about a substantially horizontal axis remote from said lifting means from a stored position in the rear of the towing vehicle to operative positions extending rearwardly from said towing vehicle; means for raising and lowering said gate between positions corresponding to the stored position of said beam, a loading position whereby said lifting means may be placed beneath the disabled vehicle, and a towing position for transporting the disabled vehicle; and stop means for rigidly supporting said beam in the operative positions to preclude pivotable move-

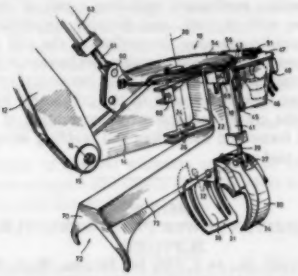
ment of the beam by the lifting force exerted thereon by the load of the disabled vehicle.

4,451,194

INTEGRAL HEEL TREE LENGTH GRAPPLE

Kevin Keats, and John Kurelek, both of Brantford, Canada, assignors to Koehring Canada Limited, Brantford, Canada

Filed Apr. 26, 1982, Ser. No. 371,673
Int. Cl.³ B66C *1/32*
U.S. Cl. 414—731 **5 Claims**



1. A grapple for lifting and manoeuvring elongated items, comprising:

a main frame mounted for pivoting about a substantially horizontal first pivot axis,

a sub-frame pivotally and hingeably mounted to the main frame about a second axis which is substantially vertical when the grapple is in operative position, at least a portion of the sub-frame being horizontally adjacent the main frame when the second axis is vertical, the pivoting of the sub-frame with respect to the main frame being limited to an angle less than 360°, due to mechanical interference between the main frame and the sub-frame, whereby the vertical dimension of the grapple is minimized,

tree-grappling means on the sub-frame, with first power means for operating the tree-grappling means,

a sprocket fixed to the main frame in a plane perpendicular to said second axis, the sprocket being concentric with said axis,

a pinion mounted rotatably on the sub-frame and located in the same plane as the said sprocket,

second power means for rotating the pinion with respect to the sub-frame in either direction selectively,

an endless chain entrained around the sprocket and pinion, whereby rotation of the pinion causes the sub-frame to swivel with respect to the main frame, and

non-articulating heel means rigid with the sub-frame spaced from said tree-grappling means and including an inverted fork structure in which the elongated items can lodge.

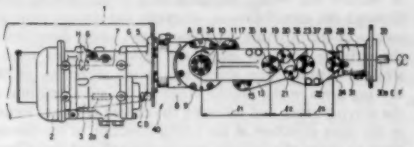
4,451,195

ARM FOR A PROGRAM CONTROLLED MANIPULATOR

Akira Kikuchi, Kawasaki; Susumu Sawano, Koganei, and Yoshimasa Ito, Yokohama, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Jun. 11, 1982, Ser. No. 387,747
Claims priority, application Japan, Jun. 15, 1981, 56-91936
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—732 **7 Claims**

1. An arm for a manipulator comprising a first arm member supported on support means, a second arm member rotatably connected at one end thereof to the first arm member, a third arm member rotatably connected to the second arm member, a fourth arm member rotatably connected to the third arm member, a first link member connected at one end thereof to the first arm member and at the other end thereof to one end of the third arm member respectively, and a second link member connected at one end thereof to the other end of the second arm member and at the other end thereof to one end of the fourth arm member respectively, the distance between the rotational center for the second arm member relative to the first arm member and the rotational center for the third arm



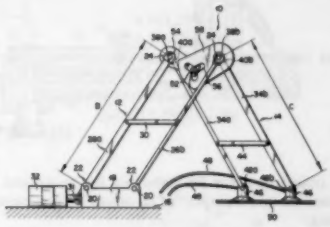
member relative to the second arm member being greater than the distance between the rotational center for the third arm member relative to the second arm member and the rotational center for the fourth arm member relative to the third arm member.

4,451,196

TRANSFER APPARATUS

Yutaka Harada, and Kouji Takai, both of Fuji, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1982, Ser. No. 395,310
Claims priority, application Japan, Jul. 8, 1981, 56-106516
Int. Cl.³ B66C *1/00*
U.S. Cl. 414—733 **15 Claims**



1. A transfer apparatus comprising:

a driving-side parallel link including a support member and first and second driving arms parallel to each other, each driving arm having a pivotal portion pivotally supported on the support member and a coupling portion separated from the support member and swingable around the pivotal portion;

drive means for swinging the first and second driving arms;

a driven-side parallel link including a first driven arm having a pivotal portion coupled with the coupling portion of the first driving arm and a support portion separated from the pivotal portion of the first driven arm toward the support member and swingable around the pivotal portion of the first driven arm, a second driven arm having a pivotal portion coupled with the coupling portion of the second driving arm and a support portion separated from the pivotal portion of the second driven arm toward the support member and swingable around the pivotal portion of the second driven arm, and a coupling arm coupling the first and second driven arms parallel to each other;

holding means attached to the support portions of the first and second driven arms to hold an object of transfer; and

transmission means for transmitting swing displacements of the first and second driving arms to the first and second driven arms to displace the driven arms swingingly in accordance with the swing displacements of the driving arms, the transmission means including a first transmission member attached to the first driving arm in the vicinity of the coupling portion of the first driving arm, the first

transmission member having a cam follower for transmitting the swing displacements of the driving arms to the driven arms, and a second transmission member attached to the second driven arm in the vicinity of the pivotal portion of the second driven arm, the second transmission member having a cam opening to engage the cam follower to receive the swing displacements of the driving arms through the cam follower, whereby the driven arms are swung in the opposite direction to the swing direction of the driving arms to move the holding means onto a straight transfer line along the swing direction of the driving arms in the middle stage of the swing motion of the driving arms, and whereby the driven arms are swung in the same direction as the swing direction of the driving arms to move the holding means toward and away from the transfer line in the initial and final stages, respectively, of the swing motion of the driving arms.

4,451,197

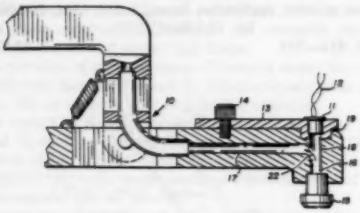
OBJECT DETECTION APPARATUS AND METHOD

Bradley N. Lange, Chandler, Ariz., assignor to Advanced Semiconductor Materials Die Bonding, Inc., Chandler, Ariz.

Filed Jul. 26, 1982, Ser. No. 401,936

Int. Cl.³ B66C *1/00*

U.S. Cl. 414—737 **4 Claims**



1. An object detector for detecting the successful engagement, retention and transport of an object by a vacuum orifice comprising:

a vacuum orifice whereby an object is engaged, retained and transported;

a vacuum flow path communicating with said vacuum orifice;

a photoelectric ligh sensor disposed in the vacuum flow path so as to detect light entering the vacuum orifice, and to detect the absence of light when the orifice is blocked by a successfully engaged, retained and transported object.

4,451,198

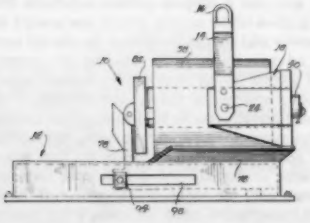
MATERIAL HANDLING DEVICE

Edward T. Sanderson, 22552 Arquilla, Richton Park, Ill. 60471

Filed Jul. 17, 1978, Ser. No. 924,972

Int. Cl.³ B65G *7/08*

U.S. Cl. 414—779 **2 Claims**



1. A material handling device for a crane mechanism comprising a generally "U" shaped support, connectable to said crane mechanism, a frame also generally "U" shaped and pivot means connected to said frame and support whereby said frame is freely pivoted within said support, securing means on said frame adapted to be inserted through the center of a coil of material, a pair of securing arms within said securing means, actuating mechanism operative to extend said arms whereby said arms can engage an end of the coil for transport of said coil material when said device is connected to said crane mechanism, said pivot means being so designed that said coil can be changed from a vertical to a horizontal position and vice-versa using the weight of the coil, said device including a floor mounted pivoting mechanism including a pair of horizontal and stationary rails pivotally and slidingly supporting a coil cradle, said cradle engaging the surface of the coil and said securing means whereby said pivoting mechanism is usable to change the orientation of said coil from horizontal to vertical and vice-versa without damage to the coil solely by use of gravity and the crane mechanism by cooperation of the free pivot of said frame and the sliding and pivoting mounting of the cradle in said rails.

4,451,199

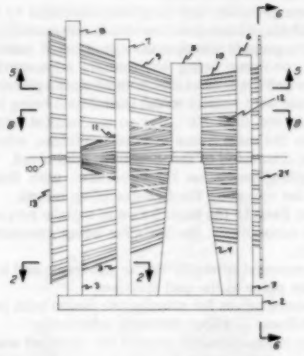
WIND DRIVEN POWER PLANT-STRUCTURAL SUPPORT

Walter E. Currah, Jr., 44 S. 64th St., Tacoma, Wash. 98409

Continuation of Ser. No. 28,685, Apr. 10, 1979, abandoned. This application Nov. 7, 1980, Ser. No. 204,810

Int. Cl.³ F03D *1/04*

U.S. Cl. 415—2 A **7 Claims**



1. A structural support system for a wind driven apparatus, said structural support system comprising:

a plurality of support frames, each frame of which includes an outer support ring and an inner support ring with connecting means connected to and extending between said outer and inner support rings to support said outer and inner support rings coaxial relative to one another, said plural support frames including a forward support frame, a rearward support frame, and an intermediate support frame located between said forward and said rearward support frames;

support column means connected to said support frames to support said support frames relative to a foundation with said support frames coaxial with and spaced along a longitudinal axis of said structural support system;

the outer support ring of said intermediate support frame having a smaller diameter than the outer support rings of said forward and rearward support frames and the inner support ring of said intermediate support frame having a larger diameter than the inner support rings of said forward and rearward support frames;

a plurality of first elongated longitudinally directed stringers

connected to and extending between said outer rings and a plurality of second elongated longitudinally directed stringers connected to and extending between said inner support rings of said forward, intermediate, and rearward support rings;

said first-mentioned stringers each subdivided into two portions, a first portion of said first-mentioned support stringers extending between said outer support rings of said forward and intermediate support frames and a second portion extending between the outer support rings of said intermediate and rear support frames, said first portion of said first-mentioned stringers secured to the inside surface of the outer support ring of said forward support frame and also secured to a sidewall face of the outer support ring of said intermediate support frame, and said second portion of said first-mentioned stringers secured to the outer support frame of said rearward support frame at the inside diameter surface thereof and to a sidewall face of the outer support ring of said intermediate support frame; and

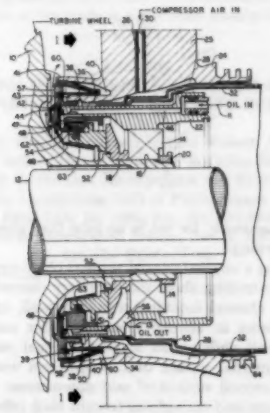
a plurality of circular stiffeners secured to said first-mentioned stringers and axially spaced relative to one another along said longitudinal axis.

4,451,200

AIR AND OIL COOLED BEARING PACKAGE

Zoltan L. Libertini, Stamford, and Edward O. Hartel, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Oct. 8, 1980, Ser. No. 195,050
Int. Cl.³ F01D *25/16*
U.S. Cl. 415—110 **1 Claim**



1. In the turbine section of a gas turbine engine, said engine having means to supply pressurized cooling air and coooled oil to said turbine section, said turbine section including a structural shroud which defines a flow path for the hot gases of the engine; a structural assembly for supporting a bearing package which includes bearing and seal assemblies which, in turn, support the engine shaft in said turbine section comprising:

struts radially extending inward from the shroud;

an inner structural member fixed to the struts and adapted to receive and support the bearing package, said member providing a cooling air supply plenum surrounding said bearing package;

a conduit constructed in a strut and connected to the pressurized supply of cooling air to deliver cooling air to the air supply plenum;

a cylindrical shield defining the inner wall of the air supply plenum of the inner structural member, said shield being constructed with a sealed insulating air cavity; said shield and cavity surrounding the bearing package;

a bearing housing constructed to receive the bearing assembly of the bearing package, and fixed within the inner support structure, radially inward from the cylindrical shield, said housing having a duct communicating with the cooled oil supply of the engine;

a seal housing constructed to receive the seal assembly of the bearing package and to secure said assembly in operative association with the bearing assembly, said housing being fixed to the inner support structure and being constructed with an annular passage communicating with the oil supply duct and circulating oil within the seal housing to cool said housing, said passage having a plurality of jets to inject oil into the seal assembly and the bearing assembly;

means communicating with the air supply plenum to distribute cooling air to and around the seal housing;

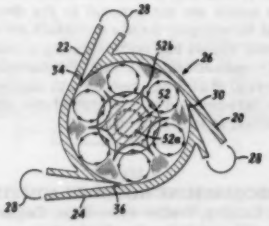
said air supply means, said oil duct and passage and said sealed insulating air cavity being relatively positioned to cooperatively insulate the oil contacting surfaces in the seal and bearing assemblies from the hot turbine flow path.

4,451,201

GAS TURBINE

Stirling A. Colgate, Los Alamos, N. Mex., assignor to Colgate Research & Development Co., Princeton, N.J.

Filed Sep. 14, 1981, Ser. No. 302,255
Int. Cl.³ F01D *1/02*
U.S. Cl. 415—181 **4 Claims**



1. A gas turbine comprising a chamber defined by a substantially circular cylindrical peripheral surface and spaced-apart end surfaces, said chamber having an axis coincident with the geometric central axis of said circular cylindrical peripheral surface, at least one nozzle opening tangentially to the chamber at the cylindrical surface, a rotor mounted for rotation about the axis of the chamber, the rotor having a multiplicity of equally circumferentially spaced-apart flutes that extend parallel to the axis of the chamber, have interconnected arcuate side surfaces defining a multiplicity of outwardly facing concave substantially semi-cylindrical surfaces on the rotor and have tips spaced-apart radially inwardly from the cylindrical surfaces by a distance substantially equal to the circumferential spacing between the tips of adjacent flutes, and ports in the end surfaces located proximate to the radially innermost portions of the semi-cylindrical surfaces of the rotor, whereby a symmetrical set of multiple axial vortices, each nested between flutes of the rotor, co-rotate with the rotor and drive or are driven by the rotor to supply to or receive from the rotor kinetic energy.

4,451,202

AXIAL COOLING FAN FOR INTERNAL COMBUSTION ENGINES

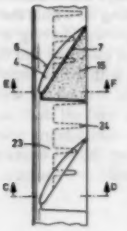
Kurt Hauser, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,986

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855909

Int. Cl.³ F01D 5/12, 5/34; B23P 15/02

U.S. Cl. 416—214 R 13 Claims



1. A fan wheel or the like, for producing an at least partially axial air flow comprising a hub portion and a blade portion, said hub portion and said blade portion being fabricated integrally in one piece, said blade portion comprising a plurality of at least stub fan blades, said at least stub fan blades being exposed to the air flow through said fan wheel or the like, said hub portion being formed so as to increase in diameter in the portions of said hub portion exposed to the air stream upstream of said at least stub fan blades and to increase in diameter in the regions of said hub portion lying between said at least stub fan blades of said blade portion, said portions of said hub portion between said at least stub blades forming part of the air foil of said hub portion extending between said at least stub blades, the portions of said hub portion downstream of said at least stub blades which are not exposed to the direct air stream through said fan wheel or the like and which are not part of the air foil formed by said hub portion having a contour which is substantially cylindrical, and said substantially cylindrical contour portion of said hub portion and said portion of said hub portion between said at least stub blades joining together upstream of said at least stub blades.

4,451,203

TURBOMACHINE ROTOR BLADE FIXINGS

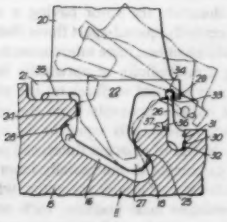
Kenneth R. Langley, Wotton-under-Edge, England, assignor to Rolls Royce Limited, London, England

Filed Mar. 11, 1982, Ser. No. 357,220

Claims priority, application United Kingdom, Apr. 29, 1981, 8113277

Int. Cl.³ F04D 12/01; F01D 5/32

U.S. Cl. 416—215 22 Claims



1. A bladed rotor assembly for a turbomachine comprising a hub having a dovetail shaped, circumferentially extending blade retaining slot, and a plurality of aerofoil shaped blades having dovetail shaped roots, each root having a toe portion and a heel portion, said roots being mounted in the blade retaining slot, the blade retaining slot having a radial cross-sectional shape dimensioned, constructed and arranged to permit the toe portion of the dovetail shaped roots to be first inserted into a corresponding toe portion of the blade retaining slot, and a heel portion of the dovetail shaped roots to be subsequently inserted into a corresponding heel portion of the blade retaining slot, thereby radially aligning the blade root portion in the dovetail shaped slot; and a blade root platform located between the dovetail shaped roots and the aerofoil shaped blades and provided with support means for radially outwardly torquing the blade root platform.

4,451,204

AEROFOIL BLADE MOUNTING

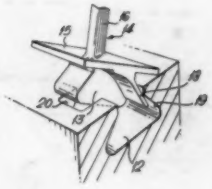
George Pask, Stanton-by-Bridge, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 15, 1982, Ser. No. 359,798

Claims priority, application United Kingdom, Mar. 25, 1981, 8109416

Int. Cl.³ F01D 5/30

U.S. Cl. 416—215 4 Claims



1. A blade assembly for use in an axial flow compressor or turbine comprising:

a disc having a circumferential aerofoil blade root retaining channel extending about the periphery thereof, said root retaining channel including a bottom wall, an upstream wall defining an annular internal surface and a downstream wall defining an annular internal surface, said annular internal surface of said upstream wall and said annular internal surface of said downstream wall being spaced from and converging toward each other;

an annular array of aerofoil blades, each of said aerofoil blades including an aerofoil portion, a platform, and a root, said root of each of said annular array of aerofoil blades having an axial cross-section substantially identical to and being positioned in said root retaining channel, the root of each of said aerofoil blades being circumferentially spaced apart from the root of an adjacent one of said aerofoil blades to provide circumferential gaps therebetween in said root retaining channel, and

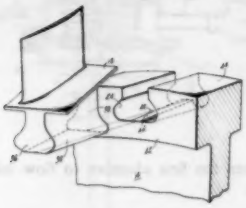
sealing means integral with each root of each of said blades, said sealing means being located in said root retaining channel and only partially occupying each of said circumferential gaps, said sealing means and said blade roots cooperating to define a substantially annular sealing surface in abutting sealing engagement with at least the annular internal surface of said upstream wall of said root retaining channel.

4,451,205

ROTOR BLADE ASSEMBLY

Keith T. Honda, Manchester; Stephen L. Smith, South Windsor, and Peter E. Voyer, Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 22, 1982, Ser. No. 351,061
Int. Cl.³ F01D 5/30, 5/22, 5/32
U.S. Cl. 416—219 R 2 Claims



1. For an axial flow gas turbine engine having a rotor assembly of a type including an array of rotor blades extending outwardly from the periphery of a rotor disk and wherein the airfoil section of each of said rotor blades has shroud segments extending laterally from the suction and pressure sides thereof into opposing relationship with corresponding shroud segments of the adjacent rotor blades, the improvement comprising:

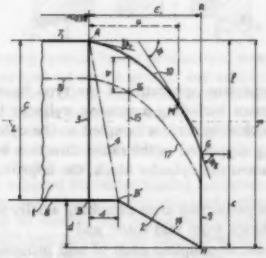
means for attaching each rotor blade to a corresponding attachment slot at the periphery of the rotor disk wherein the root section of the blade and the attachment slot of the disk are contoured to provide increasing clearance between the bottom of the blade root section and the attachment slot as the blade is withdrawn axially from the slot.

4,451,206

BLADE END FOR ROTARY WING OF AN AIRCRAFT AND ROTARY WING PROVIDED WITH SUCH BLADE ENDS

Jean-Jacques Philippe, Versailles, and Robert M. Lyothier, Miramas, both of France, assignors to Office Nationale d'Etudes et de Recherches Aerospatiales and Societe Nationale Industrielle Aerospatiale, both of Paris, France

Filed May 26, 1982, Ser. No. 381,934
Claims priority, application France, Jun. 5, 1981, 81 11232
Int. Cl.³ B64C 27/46
U.S. Cl. 416—228 10 Claims



1. A helicopter rotor blade of selected span having a leading edge, a trailing edge, a chord dimension extending between said edges, as inboard blade section having an inner end adapted to be attached to a hub for rotation therewith about an axis, and an outboard tip section at the outer end of said inboard blade section,

said tip section having a span which is 5–15% of the span of said blade, and a leading edge and a trailing edge which form extensions of the leading edge and trailing edge respectively of said inboard section,

said tip section having a maximum chord which is not larger than the chord of the outer end of said inboard blade section adjacent said tip section, said tip section being tapered so that its chord diminishes towards its outboard end,

the leading edge of said tip section being swept rearwardly from a first point of juncture with the leading edge of said inboard blade section to a terminal point which is disposed rearwardly of a line of span midway between the leading and trailing edges of said inboard blade section,

the leading edge of said tip section being curvilinear and having a sweep angle ϕ which varies progressively and continuously from a value of 0°–30° at said first point of juncture to a value of 60°–90° at said terminal point,

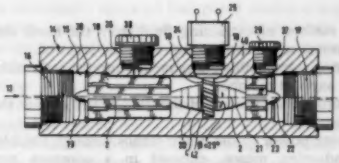
the trailing edge of said tip section including a first inboard portion which forms a colinear extension of the trailing edge of said inboard blade section and a second outboard portion which is swept rearwardly relative to the trailing edge of said inboard section, said first and second portions meeting at a second point of juncture which is more remote from said axis of rotation than is said first point of juncture, the distance between said first and said second points of juncture, measured along a line parallel to the span of said blade, being 5–15% of the chord of the outboard end of said inboard blade section.

4,451,207

TURBINE ROTOR FOR A FLOW METER

Helmuth Hoffmann, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Hydrotechnik GmbH, Limburg, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,530
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3112959
Int. Cl.³ F03B 13/00
U.S. Cl. 416—237 R 7 Claims



1. A turbine rotor for flow meter comprising a cylindrical rotor disk having a rotor axis, a plurality of rotor vanes extending radially from said cylindrical rotor disk, at an angle of inclination β with said rotor axis, a flat surface between each of said rotor vanes wherein each flat surface abuts a vane on each side forming lines of abutment, said lines of abutment being parallel.

4,451,208

PROPELLER

Jerzy Kolecki, Osbyringen 48, S-163 05 Stockholm, Sweden

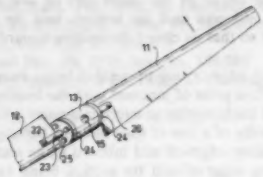
Continuation of Ser. No. 275,266, Jun. 19, 1981, abandoned.
This application May 23, 1983, Ser. No. 496,527
Int. Cl.³ B64C 11/16, 27/46
U.S. Cl. 416—237 4 Claims

1. A propeller blade having:

an elongated, straight, leading edge portion which is streamlined in cross-section and is of constant cross sectional area and shape from its hub end to its tip,

a straight planar trailing edge portion formed integrally with the leading edge portion, the trailing edge portion merging with one longitudinal edge of the leading edge portion and extending along the entire length of this edge,

the trailing edge portion having substantially constant thickness which is less than that of the leading edge portion,



the trailing edge portion having its maximum width at its hub end and its minimum width at its tip.

4,451,209

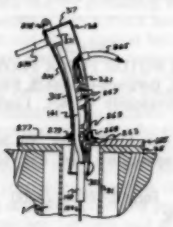
METHOD AND APPARATUS FOR PUMPING SUBTERRANEAN FLUIDS

Edward H. Phillips, Middletown, Calif., assignor to Hidden Valley Associates, Inc., Middletown, Calif.

Filed Mar. 19, 1981, Ser. No. 245,614

Int. Cl.³ F04B *47/00*

U.S. Cl. 417—38 **19 Claims**



1. A method of extracting fluid from the earth through a hole formed in the earth comprising the steps of:

lowering submersible pump means into the hole with a flexible support member;

measuring the pressure of the fluid in the hole at the pump means;

applying power to the pump means through flexible power conducting means, encased in a common protective sheath with the flexible support member, in response to the pressure of the fluid; and

transporting fluid pumped by the pump means to the surface of the earth through flexible fluid transport means encased in a common protective sheath with the flexible support member and the flexible power conducting means.

4,451,210

DIAPHRAGM VAPOR PUMP

Robert M. Shaubach, Lititz; George Y. Eastman, Lancaster, and Vincent P. Roehm, Landisville, all of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed May 14, 1982, Ser. No. 378,402

Int. Cl.³ F04B *19/24*

U.S. Cl. 417—52 **12 Claims**

1. A liquid pump comprising:

a first chamber including liquid entry and liquid exit means;

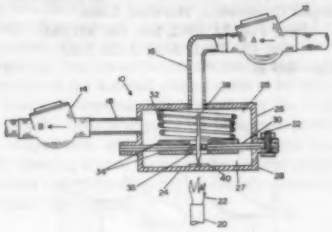
a second chamber;

a flexible diaphragm separating the first and second chambers;

at least one unidirectional flow means connected in series with the first chamber in a liquid flow path;

a heat source acting upon the second chamber; and

leak means constructed integral with the flexible diaphragm interconnecting the first and second chambers, including vent means for vapor pressure from the second chamber to flow into the first chamber and liquid supply means for



liquid from the first chamber to flow into the second chamber.

4,451,211

RADIAL PISTON COMPRESSOR AND DRIVE MOTOR COUPLING ARRANGEMENT

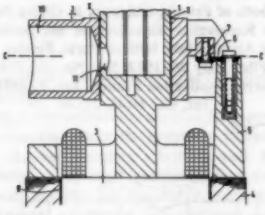
Siegfried Schönwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,554

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121874

Int. Cl.³ F04B *35/04, 17/00*

U.S. Cl. 417—271 **2 Claims**



1. In a compressor apparatus of the type having a radial piston compressor including a rotative cylinder block and a drive motor including a rotor coupled to the cylinder block, the rotor being supported in the radial direction by the cylinder block adjacent the cylinder block, the improvement comprising:

a plurality of projecting arms extending axially towards said cylinder block from said rotor; and

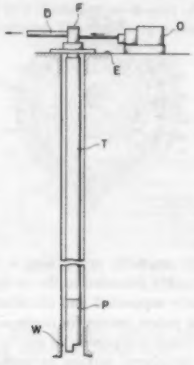
leaf spring means coupling each of said projecting arms to said cylinder block, said leaf spring means being disposed in approximately the center plane of the cylinder block, said leaf spring means having two ends, one of said ends being fastened to said cylinder block and the other end being fastened to one of said projecting arms, one of said ends of said leaf spring means having two fastening points spaced apart from each other so that said leaf spring means are flexible in the axial direction of said rotor but are substantially rigid in the radial and tangential directions.

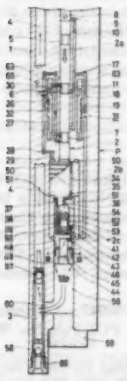
4,451,212

PUMPING SYSTEM FOR OIL PRODUCTION

Isao Yamato, and Tominori Yamada, both of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co. Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,981
Claims priority, application Japan, Nov. 17, 1980, 55-160752; Dec. 30, 1980, 55-187412
Int. Cl.³ F04B 47/08
U.S. Cl. 417—313 2 Claims





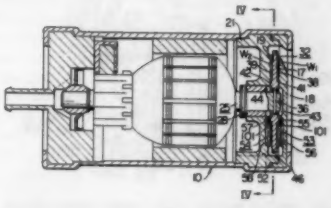
1. A pumping system for oil production, comprising:
a hydraulic unit set on the ground and adapted to send out a high-pressure oil having a viscosity lower than that of crude oil to be drawn up; and
a pump unit set in an oil well and adapted to draw up crude oil, said pump unit including,
a pump cylinder, and
a plunger adapted for reciprocating movement in said pump cylinder, said plunger being provided with an oil reservoir adapted to receive the high-pressure oil sent from said hydraulic unit thereto, the high-pressure oil causing said plunger to be reciprocatingly moved,
a clearance formed between that portion of the outer circumferential surface of said plunger which is on the side of a cylinder chamber and the inner circumferential surface of said pump cylinder, said clearance communicating with said oil reservoir, the high-pressure oil being ejected from said clearance along the inner surface of said pump cylinder into said cylinder chamber while said plunger is reciprocatingly moved in said pump cylinder, wherein said oil reservoir is provided in the central portion of said plunger and communicated via a plurality of capillaries extending radially therefrom with said clearance provided outside the outer circumferential surface of said plunger,
a hydraulic piston fixed to said plunger and adapted for reciprocating movement between a pair of opposing oil chambers, such that said high-pressure oil is received in each of said opposing oil chambers, and
a pair of communicating lower chambers formed within said plunger, said lower chambers containing a slider adapted for reciprocating movement therebetween in response to said high-pressure oil from said oil chambers, the reciprocating movement of said slider causing the high-pressure oil to be pumped into said oil reservoir.

4,451,213

ELECTRICALLY OPERATED FUEL PUMP DEVICE HAVING A REGENERATIVE COMPONENT

Toshihiro Takei, Kariya; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Kiyohiko Watanabe, Chiryu; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 29, 1982, Ser. No. 362,855
Claims priority, application Japan, Mar. 30, 1981, 56-46954
Int. Cl.³ F04B 35/04; F04D 5/00; F01D 3/00
U.S. Cl. 417—366 8 Claims



1. An electrically operated fuel pump device comprising a regenerative pump component and an electric motor component operatively connected to said regenerative pump component to actuate the same, said regenerative pump component comprising:
a pump casing having inner surfaces thereof in axially opposed, but spaced relation to each other, said inner surfaces of said pump casing cooperating with each other to define therebetween a pump chamber, said pump casing further having defined therein suction and discharge ports communicated with said pump chamber;
an impeller operatively connected to said electric motor component and disposed within said pump chamber rotatably around a rotational axis and axially movably therein, liquid fuel being sucked into said pump chamber through said suction port, increased in pressure to a discharge pressure and discharged from said pump chamber through said discharge port when said impeller is rotated in said pump chamber, said impeller having axial end faces thereof cooperating with said inner surfaces of said pump casing to define first and second clearances therebetween, respectively;
pressure introducing means for introducing the liquid fuel at the discharge pressure into said first and second clearance to cause the liquid fuel to act on said axial end faces of said impeller to minimize the direct contact of said axial end faces of said impeller with said respective inner surfaces of said pump casing,
a common housing having disposed therein said regenerative pump component and said electric motor component, said discharge port being communicated with a space within said housing,
wherein said pressure introducing means introduces the liquid fuel at the discharge pressure into the narrowest

portion of said first clearance and into the narrowest portion of said second clearance,

an annular projection formed on one of each of said inner surfaces of said pump casing and each of said axial end faces of said impeller in concentric relation to the rotational axis of said impeller, said annular projections on one of said inner surfaces of said pump casing and said axial end faces of said impeller projecting toward and cooperating with the other of said inner surfaces of said pump casing and axial end faces of said impeller to define said narrowest portions of said first and second clearances, respectively,

wherein said annular projections are integrally formed on said axial end faces of said impeller, respectively.

4,451,214

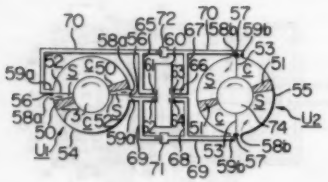
ROTARY PISTON TYPE FLUID MACHINE

Rokuro Kagamiyama, 1069-181, Tsu, City of Kamakura, Kanagawa Prefecture, Japan

Division of Ser. No. 157,394, Jun. 9, 1980, abandoned. This application Sep. 16, 1982, Ser. No. 418,743

Int. Cl.³ F04C *23/00, 27/00*

U.S. Cl. 418—11 **7 Claims**



1. A rotary piston type fluid machine comprising a plurality of rotary piston type fluid machine units singly or in combination, each of said fluid machine units comprising a doughnut type ring-shaped annular cylinder with an annular slit being formed in the wall around the inner periphery so as to lie in a plane containing the annular center line of said cylinder, a rotor rotatively mounted to said cylinder centrally with its peripheral portion being sealingly and shiftably received in said slit, a rotor shaft means connected to said rotor centrally to transmit or take out power thereto or therefrom, one or more rotary pistons secured to the peripheral surface of said rotor and adapted to be shifted within said cylinder, and one or more gate valves provided in said cylinder so as to retractably protrude into said cylinder across it and adapted to partition chambers within said cylinder between them and said rotary pistons when protruding into said cylinder, said gate valve and said rotary pistons being operated in synchronization with each other and being shifted in relation to each other, said fluid machine units being arranged in a side-by-side relationship with said rotors being connected together by a common rotor shaft, and with said fluid machine units each being respectively operated as a compressor with the relative process phases of said rotary pistons of said fluid machine units being shifted in relation to each other by a predetermined process phase angle between said units, a compressed gas accumulating reservoir, said fluid machine units being adapted to supply in alternation gases compressed by them to said compressed gas accumulating reservoir, compressed gas transfer valves cooperating with said rotary pistons and said gas accumulating reservoir to convey the remaining compressed gas of one of said compressors just before the final compression process into another of said compressors which is under an intermediate compression process, whereby the total compression efficiency of said compressors is considerably improved.

4,451,215

ROTARY PISTON APPARATUS

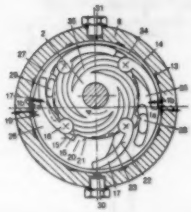
Ottmar Winkler, Schweinfurt, and Egon Pfaller, Dittelbrunn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,058

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014520

Int. Cl.³ F04C *2/00*

U.S. Cl. 418—23 **9 Claims**



1. Rotary piston assembly comprising a housing having a bore, a piston rotatably mounted in the housing, a plurality of slide vanes pivotally supported and distributed about the circumference of said piston, means for controlling pivotal movement of said slide vanes comprising an axially movable member having a conical peripheral surface mounted in a bore of the rotary piston shaft and a plurality of elongated pins engaging in radially disposed slots in the piston disposed at an angle to a radial plane through the axis of the conical member and pivot axis of the slide vane, one terminal end of said pins engaging an arcuate recess in an end section of the slide vane and the opposite end engaging the outer peripheral surface of said conical member.

4,451,216

PLANETARY HYDRAULIC MOTOR WITH STATOR GEAR HINGED TO A HOUSING

Fedor N. Erasov, Odessa; Boris A. Chumachenko, and Vladimir M. Potaichuk, both of Zaporozhie, all of U.S.S.R., assignors to Zaporozhsky Konstruktorsko-Tekhnologichesky Institut Selskokhozyaistvennogo Mashinostroenia, Zaporozhie, U.S.S.R.

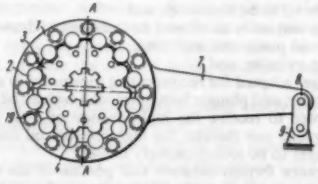
PCT No. PCT/SU81/00047, 371 Date Feb. 23, 1982, 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00173, PCT Pub. Date Jan. 21, 1982

PCT Filed May 29, 1981, Ser. No. 355,544

Claims priority, application U.S.S.R., Jul. 8, 1980, 2952646

Int. Cl.³ F03C *2/00*

U.S. Cl. 418—61 B **1 Claim**



1. A planetary hydraulic motor comprising a stator gear having interior teeth, a rotor mounted eccentrically inside said stator gear and having exterior teeth, said rotor being mounted directly on a drive shaft of an actuating mechanism and having passages communicating with spaces between said interior and said exterior teeth, said spaces defining working chambers of

variable volume, cover plates adjacent to end faces of said rotor and said stator gears and provided with passageways for feeding and discharging a working fluid through said rotor passages, and an arm fixedly secured at one end to said stator gear and at an other end to a housing of said actuating mechanism.

4,451,217

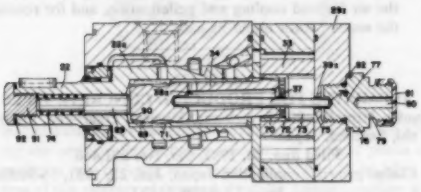
ROTARY FLUID PRESSURE DEVICE

Harvey C. White, 3733 Capilano, West Lafayette, Ind. 47906

Continuation-in-part of Ser. No. 29,019, Apr. 12, 1979, Pat. No. 4,285,643, which is a continuation-in-part of Ser. No. 903,589, May 8, 1978, abandoned. This application Jul. 16, 1981, Ser. No. 284,128

Int. Cl.³ F04C *15/00*

U.S. Cl. 418—69 **12 Claims**



1. In a rotary fluid pressure device having a housing, a presure generating member, a drive shaft, a wobble stick drivingly connecting the pressure generating member with the drive shaft, the wobble stick connected to one of the pressure generating member or drive shaft by a teeth-teeth drive, the improvement of the one of the pressure generating member or drive shaft having teeth also having an area free of teeth, the teeth of the wobble stick being selectably movable into said area free of teeth and a position of not drivingly connecting the pressure member with the drive shaft, the wobble stick being located by a rigid separate wobble stick locating pin having opposite ends engaging between the pressure generating member end of the wobble stick and the housing, and in that the rigid separate pin has two selectable effective lengths, one length locating the teeth of the wobble stick in contact with the teeth of one of the pressure generating member or drive shaft, a position of engagement, and the other length locating the teeth of the wobble stick in the area of one of the pressure generating member or drive shaft free of teeth, a position of non-engagement.

4,451,218

VANE-PISTON PUMP

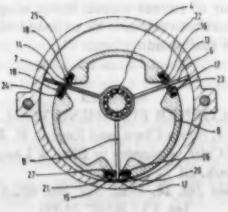
Helmut Rembold, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1982, Ser. No. 397,743

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3135978

Int. Cl.³ F04C *2/00, 15/00, 27/00*

U.S. Cl. 418—137 **5 Claims**



1. A vane-piston pump comprising a plurality of vanes within a pump housing, a rotor supported eccentrically within said pump housing and said vanes, said rotor having oppositely disposed slitted zones for the passage therethrough of said vanes, sealing strips in said slitted zones along which said vanes slide each said slitted zone is provided with an elastic cushion and a spring means which produces a spring force against said elastic cushion within said slitted zones which augments said spring means to produce a force on each of said sealing strips.

4,451,219

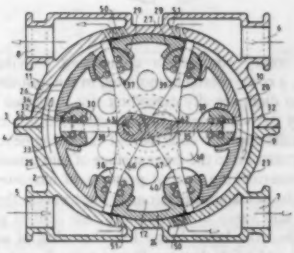
VALVELESS BI-CHAMBER ROTARY STEAM ENGINE WITH TURBINE EFFECT

Waldemar H. Kurherr, Duesseldorf, Fed. Rep. of Germany, assignor to Kurherr Motoren A.G., Baar, Switzerland

Continuation of Ser. No. 216,820, Dec. 15, 1980, abandoned. This application Sep. 28, 1983, Ser. No. 536,569

Int. Cl.³ F01C *1/00, 21/00*

U.S. Cl. 418—138 **21 Claims**



1. A displacement type rotary system turbine engine comprising:

a housing having means defining a hollow, interior chamber formed from at least three aligned and intersecting partial cylindrical members;

a stationary crankshaft mounted so as to extend across said hollow interior chamber, said crankshaft having a central axis positioned at the center of said interior chamber and two separate outboard, eccentrically positioned axes each spaced an equal predetermined distance from said central axis;

drum means rotatably and concentrically mounted within said hollow interior chamber and about said stationary crankshaft for forming said hollow interior chamber into at least two diametrically opposed radial chambers,

at least two sets of a plurality of sealing blades, each set being separately eccentrically and slidably mounted interiorly of said drum means about one of said outboard axes on said stationary crankshaft, each of said sets of blades rotating together with said drum means so that each of said at least two sets respectively rotate through a circular path and effect frictionless labyrinth sealing through only one of said at least two diametrically opposed radial chambers as said drum means rotates with each blade being radially movable therein,

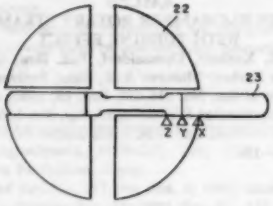
said housing further including inlet and outlet means for allowing entry and exit of a working medium to each of said at least two radial chambers,

and power take-off means operatively associated with said drum means for connecting said engine to a utility device so that as the working medium enters the inlet means for each chamber, the drum means will be rotated by the effect the working medium has on said sealing blades as said sealing blades pass through their respective radial chambers.

4,451,220
ROTARY COMPRESSOR WITH CLEARANCE BETWEEN MOVABLE VANES AND SLITS OF THE ROTOR

Seitoku Ito, Okazaki; Kenji Takeda, Aichi; Mitsuo Inagaki, Okazaki, and Nobuo Motoda, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 14, 1981, Ser. No. 311,402
Claims priority, application Japan, Oct. 16, 1980, 55-148118[U]; Oct. 16, 1980, 55-148119[U]
Int. Cl.³ F03C 2/00
U.S. Cl. 418—255 1 Claim

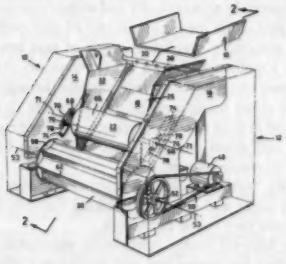


1. A rotary compressor comprising a cylindrical-shaped housing, a rotor rotatably mounted in said housing and formed with two diametrically extending slits, and two movable substantially flat vanes each slidably disposed in a corresponding slit with the opposite ends thereof extending beyond said slit in abutting relation to the inner surface of said housing, said vanes having interlocking central portions of narrower width than that of the remaining portions of said vanes, the thickness of each of said vanes in a portion of said central portion of less length than the latter being less than that of said remaining portions, and a first distance from a point X on a side surface of each vane which is contacted by the outer edge of the corresponding slit when the vane is projected to its maximum extent to a point Y on the side surface of said vane corresponding to an end of said narrower width portion of said vane and a second distance from said point Y to a point Z on the adjacent edge of said reduced thickness portion are substantially equal.

4,451,221
APPARATUS FOR THE PELLETIZATION OF HEAT-LIQUIFIABLE SOLID MATERIALS

Michael Orlander, Dundas; Robert P. Cotsworth, and Peter A. MacKenzie, both of Hamilton, all of Canada, assignors to National Slag Limited, Hamilton, Canada

Filed May 13, 1982, Ser. No. 377,755
Int. Cl.³ B22F 9/00
U.S. Cl. 425—8 8 Claims

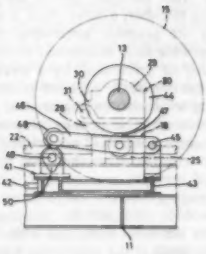


1. Apparatus for the pelletization of molten heat-liquifiable solid material comprising:
an apparatus frame,
feed plate means mounted on the frame and providing a feed surface over which the molten material flows under gravity upon being fed thereto by feeding means,
a radially-vaned first projection rotor mounted on the frame for rotation about a respective horizontal axis and on to the periphery of which the molten material is fed from the feed surface for impingement by the moving vanes and consequent projection in the form of droplets into the air for cooling and pelletization as the result of its passage through the air,
a second rotor mounted on the frame for rotation about a second axis with the periphery of the second rotor spaced above the feed surface so that material flowing under gravity on the feed surface passes through a control gap formed between the feed surface and the moving periphery of the second rotor, and
motor means for rotating the first rotor about its axis in the direction and at the speed for the required projection into the air for said cooling and pelletization, and for rotating the second rotor about its axis.

4,451,222
APPARATUS FOR PRODUCING CONCRETE PIPES

Kunizo Hiraoka, 202-5, 2-chome, Higashi, Onari-cho, Omiyashi, Saitama, Japan

Filed Jun. 23, 1982, Ser. No. 391,448
Claims priority, application Japan, Jun. 23, 1981, 56-98084
Int. Cl.³ B28B 21/22
U.S. Cl. 425—432 2 Claims



1. An apparatus for producing concrete pipes, said apparatus comprising:
a molding box for molding concrete into a pipe, said molding box having a smooth outer surface,
a single pair of runner wheels, arranged at each side of said molding box for supporting said molding box horizontally, each of said single pair of runner wheels having a smooth outer surface, at least one of said single pair of runner wheels being vertically movable,
drive means for driving the one of said single pair of runner wheels to impart smooth relation to said molding box,
vibration generating means for moving at least one of said single pair of runner wheels having a smooth outer surface vertically to impart vibrations to the smooth outer surface of said molding box, and
said single pair of runner wheels being adapted so that the distance therebetween can be adjusted according to the diameter of said molding box.

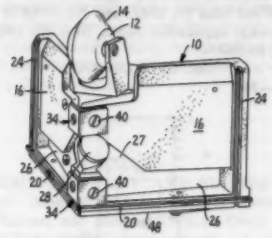
4,451,223
CORNER FINISHING TOOL

Morris F. Mower, Santa Clara, and Eugene R. Johnson, Burlingame, both of Calif., assignors to Bliss & Laughlin Industries, Inc., Oak Brook, Ill.

Filed Jul. 28, 1982, Ser. No. 402,618
Int. Cl.³ B29C 23/00
U.S. Cl. 425—458 3 Claims

1. An improved corner finishing tool for applying mastic

material along a wall joint, said tool comprising container means defining a cavity that is open in two convergent and substantially perpendicular planes and having surfaces in each of said planes that converge peripherally of said cavity; said container means comprising a pair of retainer plates resiliently joined at one edge, a pair of doctor blades mounted along intersecting edges of said retainer plates for doctoring mastic



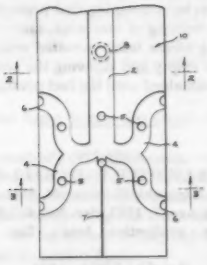
material that flows thereunder; and improved means for adjusting the resilient flex between said pair of retainer plates comprising a pair of lever arms pivotally secured to an edge portion of the retainer plates and pivotally joined together at one end, and spring means for engaging the lever arms at selected positions relative to the pivotal connection between the retainer plates and the lever arms.

4,451,224

MOLD DEVICE FOR MAKING PLASTIC ARTICLES FROM RESIN

James H. Harding, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 25, 1982, Ser. No. 361,996
Int. Cl.³ B29F *1/08*
U.S. Cl. 425—548 **24 Claims**



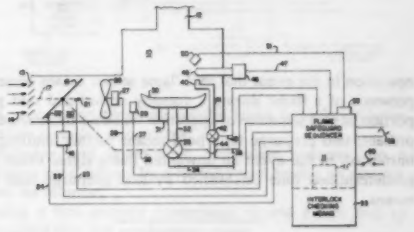
1. A device for making plastic parts from resin comprising:
(a) a plurality of cavities in a mold assembly in which the plastic parts are formed;
(b) a means for supplying resin;
(c) means for heating the mold assembly;
(d) a runner block in the mold assembly separated from the other elements of the mold assembly by a thermal barrier to insulate the runner block from the other elements of the mold assembly;
(e) at least one channel in the runner block connected to the means for supplying resin, the channel extending from the resin supply means toward the cavities for providing resin from the resin supply means to the cavities, the channel having thin, flat dimensions with two opposite sides thereof having a length substantially less than the length of the other two sides so that the channel has a cross-section sufficient to provide shear resistance resulting from forcing the resin under pressure through the thin, flat channel;
(f) means for forcing the resin from the resin supply means to the cavities; and
(g) means for elevating the temperature of the runner block independent of the means for heating the mold assembly.

4,451,225

FLAME SAFEGUARD SEQUENCER HAVING INTERLOCK CHECKING MEANS

William R. Landis, Bloomington, and Paul B. Patton, Columbia Heights, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 31, 1983, Ser. No. 462,172
Int. Cl.³ F23N *5/24*
U.S. Cl. 431—14 **7 Claims**



1. A flame safeguard sequencer for the control of a fuel burner system upon the operation of controller means for said fuel burner system with said system having start or preignition interlock means, run interlock means, damper means, ignition means, fuel supply means, and flame sensor means, including: a flame safeguard sequencer adapted to be connected to said interlock means, said damper means, said ignition means, said fuel supply means, and said flame sensor means to operate said means to properly purge, ignite and operate said fuel burner system in a predetermined timed sequence upon operation of said controller means; said flame safeguard sequencer including interlock checking means; said interlock checking means including time delay means to limit the operation of said flame safeguard sequencer for up to a fixed interval of time in the event that any of said interlock means is determined by said interlock checking means to be in an incorrect state; said interlock checking means releasing the hold of said operation of said sequencer upon said incorrect state of said interlock means clearing before said fixed time interval expires; said time delay means limiting the operation of said sequencer up to said fixed time interval; said interlock checking means providing a shut down of said burner in the event said interlock means remains in an incorrect state longer than said fixed time.

4,451,226

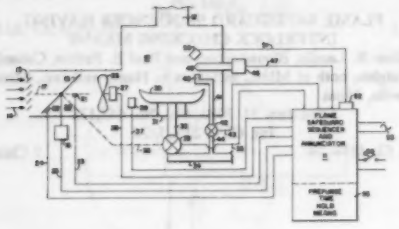
FLAME SAFEGUARD SEQUENCER HAVING SAFE START CHECK

William R. Landis, Bloomington, and Paul B. Patton, Columbia Heights, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 10, 1983, Ser. No. 456,952
Int. Cl.³ F23N *5/24*
U.S. Cl. 431—15 **4 Claims**

1. A flame safeguard sequencer for the control of a fuel burner upon the operation of controller means with said fuel burner having damper means, ignition means, fuel supply means, and flame sensor means, including: a flame safeguard sequencer connected to said damper means, said ignition means, said fuel supply means, and said flame sensor means to sequentially operate said means to properly purge, ignite and operate said fuel burner in a predetermined timed sequence

upon operation of said controller means; said flame sensor means energized by said sequencer to monitor said burner for the presence or absence of flame upon said controller means operating to initiate the operation of said fuel burner; and said sequencer including prepurge time hold means to reset and hold said predetermined timed sequence for said fuel burner



operation in the event that said flame sensor means senses the presence of a flame during a standby period and said purge portion of said sequence of operation when no flame should be present; said prepurge time hold means further shutting said burner off in the event an unwanted flame signal exists for a predetermined time established by said prepurge time hold means.

4,451,227

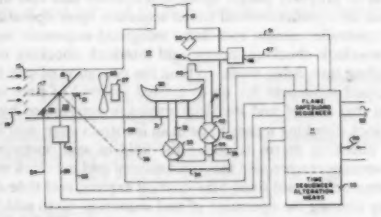
FLAME SAFEGUARD SEQUENCER HAVING SWITCH TEST FUNCTIONS

William R. Landis, Bloomington, and Paul B. Patton, Columbia Heights, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 3, 1983, Ser. No. 455,148

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—18 **5 Claims**



1. A flame safeguard sequencer for the control of a damper used to supply a fuel burner with air for purge and combustion with said fuel burner having damper drive motor means, ignition means, fuel supply means and flame sensor means, including: flame safeguard sequencer connected to said damper drive motor means, said ignition means, said fuel supply means and said flame sensor means to sequentially operate said means to properly purge, ignite, and operate said fuel burner in a predetermined timed sequence; high fire and low fire switch means mounted in proximity to said damper and normally actuated by said damper when said drive motor means moves said damper between a low fire position and a high fire position in the sequencing of said burner into normal operation; said switch means normally being open circuited when not actuated by said damper and closed circuited when actuated by said damper to thereby provide said sequencer with a change in electrical state of said switch means upon proper operation of said damper under the control of said sequencer; and said sequencer including time sequencer alteration means to extend said predetermined timed sequence for said damper operation in the event that said switch means is closed circuited when said switch means should be open circuited.

4,451,228

BURNER

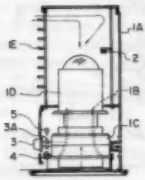
Chuzoh Wada, Nara; Yoshikazu Matsuda, Sakurai, and Yoshio Asano, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 19, 1982, Ser. No. 379,879

Claims priority, application Japan, May 20, 1981, 56-77177; Jun. 3, 1981, 56-86076

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—76 **3 Claims**



1. A burner comprising:

a wick;

means for raising said wick to a combustion position and for lowering said wick to an extinguishing position;

holding means for holding said wick raised to said combustion position, said wick being ignitable at said combustion position;

protection means for protecting against continuing combustion in the presence of oxygen depletion, said protection means detecting a change in combustion state which occurs upon oxygen depletion and releasing the holding of said wick by said holding means upon detecting said change in state; and

switch actuatable wick cleaning means for permitting the holding of said wick in said combustion position by said holding means by preventing said protection means from releasing the holding of said wick, said switch actuatable wick cleaning means being actuated when a fuel tank of said burner is empty and allowing the combustion of said wick to be maintained until the fuel contained in said wick is consumed.

4,451,229

LIQUEFIED GAS LIGHTER WITH BALL-POINTED PEN

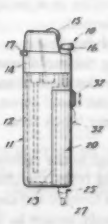
Masao Nitta, 322 Nagasaki, Shimizu-shi, Shizuoka-ken, Japan

Filed Apr. 7, 1983, Ser. No. 482,977

Claims priority, application Japan, Sep. 20, 1982, 57-142485[U]

Int. Cl.³ F23D *21/00*

U.S. Cl. 431—253 **6 Claims**



1. In a liquified gas lighter with a ball-pointed pen having a housing defining a fuel reservoir therein, a cap secured to one end of said housing, an injection wheel rotatably supported in

said cap, a spring-loaded thumb plate and a flame height adjusting member for movement within a slot in said cap, characterized by an engaging projection extending along one side wall of said fuel reservoir, a self-contained ball-pointed pen having a casing detachably connected to said fuel reservoir and having a recess extending along one side wall of the casing for receiving said engaging projection on the fuel reservoir and having a pen pusher member thereon, and said casing having a guide slot for said pen pusher member extending by a distance from one end of a second side wall of the casing, a ball-pointed pen slidable in said casing for movement between two positions, and said pen pusher member being connected to said pen and slidably fitted on said ball-pointed pen casing for moving said pen between said two positions.

4,451,230

RADIANT FLAT FLAME BURNER

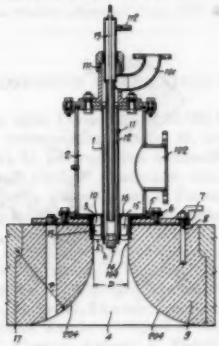
Giorgio Bocci; Alberto Dardano, both of Genoa; Vittorio Levaggi, Chiavari, and Ambrogio Milani, Ostia, all of Italy, assignors to Italimpianti Societa Impianti p.A., Genoa, Italy

Filed May 29, 1981, Ser. No. 268,649

Claims priority, application Italy, Jun. 6, 1980, 12561 A/80

Int. Cl.³ F23Q *9/00*

U.S. Cl. 431—284 **10 Claims**



1. A radiant flat flame burner for liquid and/or gas fuels, comprising:

(a) at least two centrally-arranged nozzles, one for liquid fuel outflow and another for gas fuel, an atomizing nozzle for receiving the liquid fuel nozzle and forming a part of a lance, the lance comprising one duct for delivery of the liquid fuel to the liquid fuel nozzle, and a second duct for delivery of an atomizing fluid,

each duct being connected to the atomizing nozzle which is at the extremity of the lance to atomize liquid fuel, characterized by the fact that the liquid fuel outflow nozzle, opens into a convergent-divergent conduit within said atomizing nozzle, which is connected to the duct for delivery of the atomizing fluid,

the atomizing nozzle having incorporated therein a swirling device adapted to impart a whirling motion to the atomized liquid fuel, and

(b) a coaxial combustion air annular conduit provided around the said centrally arranged nozzles and connected to a burner fire port delimited by refractory surfaces, characterized by the fact that the burner fire port has a rear cylindrical portion, with its rear end connected and coaxial with the combustion air conduit and with its front end having a flaring fore portion, widening out continuously towards its outlet end.

4,451,231

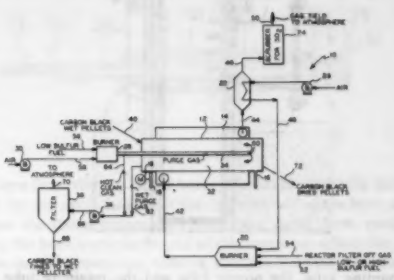
DRYING OF PARTICULATE MATERIAL

Lawrence K. Murray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1983, Ser. No. 458,504

Int. Cl.³ F27B *14/00, 15/12, 7/08;* **F26B** *7/00*

U.S. Cl. 432—13 **15 Claims**



1. A process for removing volatile liquid from liquid-laden particulate material, comprising:

introducing said liquid-laden particulate material into a drying zone defined by a closed vessel having an exterior and an interior;

burning a first mixture comprising air and a first fuel to produce first hot combustion gases;

contacting the exterior of said vessel with said first hot combustion gases to heat the interior of said vessel and thereby vaporize volatile liquid therein;

burning a second mixture comprising air and a second fuel to produce second hot combustion gases, said second fuel containing substantially less sulfur and sulfur compounds than said first fuel;

passing a first quantity of said thus produced second hot combustion gases through the interior of said vessel to purge the vaporized volatile liquid from said drying zone; and

thereafter filtering said second hot combustion gases and said thus purged vaporized volatile liquid to separate therefrom particulate material entrained therein.

4,451,232

NOZZLE BLOCK FOR ROTARY KILNS

Helmut Ernst; Karl-Heinz Gehrhardt, both of Dietzenbach; Leopold Uhl, Camberg, and Hartmut Wolert, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,670

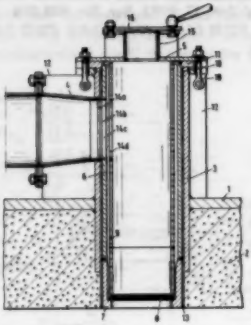
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137122

Int. Cl.³ F27B *7/00;* **B05B** *15/00*

U.S. Cl. 432—103 **6 Claims**

1. In a nozzle block for a rotary kiln having a shell, a lining, a mounting tube which extends through and is connected to the shell, a gas feed duct secured to the side of the mounting tube, a cover detachably secured to the outer end of the mounting tube, a nozzle tube which extends in the mounting tube and through the kiln lining and an orifice plate in the lower portion of the the nozzle tube, the improvement wherein: the nozzle tube forms a clearance with the mounting tube throughout the length of the body of the latter and a clearance with the furnace lining, means detachably connecting the nozzle tube at its outer end to the mounting tube, the nozzle tube comprises an abutment surface at its inner end which is engaged by the orifice plate which forms a clearance with the body of the nozzle tube and a retaining tube in the

nozzle tube which forms a clearance with the nozzle tube and with the orifice plate lying on the abutment surface, and the



mounting tube, the nozzle tube and the retaining tube have openings therein at the gas feed duct to permit gas to flow into the retaining tube and through the orifice plate.

4,451,233

APPARATUS FOR THE SHRINKING OF WRAPPING FOILS

Kurt Lachenmeier, Sonderborg, and Peter Simonson, Graasten, both of Denmark, assignors to Kurt Lachenmeier ApS, Sonderborg, Denmark

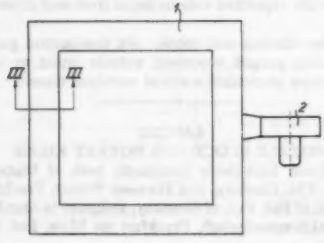
Continuation of Ser. No. 131,838, Mar. 19, 1980, Pat. No. 4,330,265. This application Mar. 18, 1982, Ser. No. 359,248

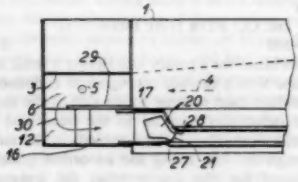
Claims priority, application Denmark, Mar. 27, 1979, 1233/79

The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.

Int. Cl.³ F23D *13/12*; F24J *3/00*

U.S. Cl. 432—224 **2 Claims**





1. Apparatus for shrinking heat-shrinkable foil around an article wrapped with said foil, said apparatus comprising:

a frame arranged to pass around an article wrapped with heat-shrinkable foil, said frame having hollow sides, each side having an elongated annular inwardly facing opening communicating with the interior of said side, each said opening having parallel elongated edges;

a gas burner tube suspended in the opening of each of said sides between the elongated parallel edges thereof, said tube extending along the corresponding side and having an elongated combustion gas exhaust port extending inwardly of said frame beyond said opening;

each said gas burner tube cooperating with the edges of the corresponding opening to define a pair of air outlet slots on opposite sides of said gas burner tube; and

an air blower for (i) forcing air out of each of the air outlet slots in streams on opposite sides of each of the gas burner tubes, so that said air cools the corresponding gas burner tube, reduces the transmission of heat from said gas burner tube to said frame, envelops, intermixes with and is heated by the combustion gases excaping from the combustion gas exhaust port of said gas burner tube between and in communication with the air streams emanating from the slots on opposite sides of said gas burner tube, and for (ii) directing the heated air inwardly of said frame to impinge upon said heat-shrinkable foil.

4,451,234

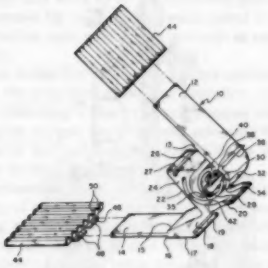
DENTAL ARTICULATOR DEVICE

Toshimi Oye, Pitman Jefferson Rd., Mullica Hill, N.J. 08062

Filed Nov. 12, 1982, Ser. No. 441,084

Int. Cl.³ A61C *11/00*

U.S. Cl. 433—54 **11 Claims**



1. A dental articulator device comprising:

(a) a lower tongue member means to receive and hold a model of the mandibular portion of the jaw,

(b) an upper tongue member means to receive and hold a model of the maxillary portion of the jaw,

(c) a lower body means providing support for holding the device and structurally connecting it to the lower tongue member,

(d) an articulator member means structurally attached and extending from the lower body means in a generally vertical direction, wherein the articulator member means comprises a member of cross sectional shape and material to allow twisting movement of the upper tongue member to simulate excursive movement of the jaw along a path of least resistance, and

(e) an attachment means hingably attaching the upper end of the articulator member means to a near end of the upper tongue member means to allow vertical movement of the outer end of the upper tongue member in relation to the balance of the dental model articulator device wherein the attachment means comprises

(i) a horizontal partial cylindrical socket member, attached to the upper end of the articulator member, and

(ii) a horizontal partial cylindrical hollow drum member structurally attached to the rear of the upper tongue member,

wherein the drum member fits into and is of the same size

or slightly larger diameter than the socket member, such that when the drum member is snapped in, the snug fit allows turning movement of the drum in the socket but holds the position at any chosen radial angle.

4,451,235

PROCESS FOR PREPARING AN ARTIFICIAL DENTAL ROOT

Kensuke Okuda, Tokorozawa; Hirosi Nagai, Chofu; Hiroto Fujimaki, Kokubunji; Atsushi Tomonaga, Tachikawa, and Hideki Aoki, Funabashi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 240,100, Mar. 3, 1981, abandoned, which is a continuation of Ser. No. 78,202, Sep. 24, 1979, abandoned. This application Apr. 4, 1983, Ser. No. 481,886
Claims priority, application Japan, Oct. 8, 1978, 53-123571
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—201 **4 Claims**

1. A process for preparing an artificial dental root comprising uniformly blending a particulate or powdered form of synthetic hydroxyapatite or calcined or sintered synthetic hydroxyapatite or a mixture thereof with an organic matrix, molding the blend, cutting the surface of the molded product, and causing the cut surface area of the molded product to be brought into contact with a bone wherein said cut surface area is composed of both a phase of said hydroxyapatite and a phase of said organic matrix in a surface area ratio of hydroxyapatite phase to organic matrix phase of from 5:95 to 70:30.

4,451,236

DENTAL PROSTHESIS AND METHOD FOR MAKING SAME

Jury A. Tarasov, ulitsa Levanevskogo, 56/10; Ljudmila V. Zhivkova, ulitsa Aviatsionnava, 19, kv. 32, both of Dnepropetrovsk; Anatoly M. Kotlyar, ulitsa Akademika Pavlova, 140G, kv. 65, Kharkov; Vasily P. Panchokha, ulitsa Furmanova, 14, kv. 26; Natalia V. Alexeenko, ulitsa Furmanova, 14, kv. 26, both of Dnepropetrovsk; Anatoly I. Grabchenko, ulitsa Pushkinskava, 74, kv. 67, Kharkov; Viktor G. Lappo, ulitsa, 7 Korpus 4, kv. 55, Moscow; Albert M. Boyarunas, ulitsa Sverdlova, 154, KV. 73, Kharkov; Vitaly F. Drozhin, ulitsa Barrikadnaya, 26, kv. 85, Kharkov; Anatoly A. Andreev, ulitsa Danilevskogo, 31, kv. 47, Kharkov; Igor V. Gavrilko, prospekt Traktorostroitelei, Kharkov; Mikhail A. Napadov, ulitsa Rollana, 9, kv. 7, Kharkov; Valentin G. Padalka, ulitsa Danilevskogo, 10, kv. 122, Kharkov, and Abram L. Sapozhnikov, ulitsa Vasilevskoi, 15, kv. 52, Kiev, all of U.S.S.R.

Filed Aug. 11, 1983, Ser. No. 522,264
Int. Cl.³ A61C *5/08*
U.S. Cl. 433—207 **10 Claims**

1. A dental prosthesis comprising a base of a durable corrosion-resistant metallic alloy and at least one external decorative layer of a harder material than the base comprising compounds of metals of the subordinate subgroup of Group IV of the periodic system selected from the group consisting of nitrides, oxynitrides, carboxynitrides, cyanonitrides and monoxides of these metals and mixtures of said compounds, the thickness ratio of said external decorative layer to the base being equal to 1:10-200 respectively.

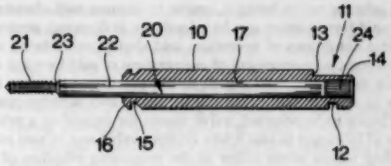
4,451,237

DENTAL ANCHORING MEANS

Stuart J. Filhol, Castlefreke, County Cork, Ireland

Filed Jan. 6, 1982, Ser. No. 337,403
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **6 Claims**

1. Dental anchoring means comprising a threaded pin for insertion into a preformed hole in a tooth, a shank integral with the pin, a neck intermediate the pin and the shank whereby the pin is detached from the shank after insertion in said hole, and a connecting member including latching means at one end thereof for locating the member in a handpiece by which the pin is rotated in said hole, the connecting member having an open-ended bore extending longitudinally thereof and a portion of the shank being located in the bore, said portion being, along at least part of its length, of enlarged section to define fixing means which provide a force fit between the enlarged section and the bore when the shank and pin are inserted along



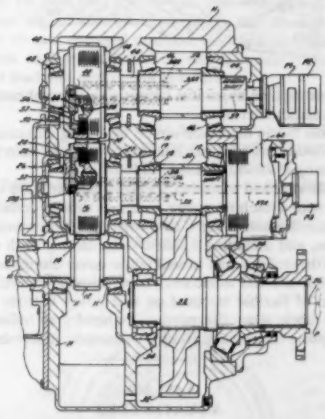
the bore from the end of the bore adjacent the latching means with the pin projecting from the opposite end of the bore, and in use the fixing means preventing the shank from passing along the bore towards the end of the bore from which the pin projects and preventing relative rotation between the shank and connecting member.

4,451,238

SHAFT BRAKE FOR MARINE PROPULSION SYSTEM

Bruce C. Arnold, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Sep. 7, 1982, Ser. No. 415,332
Int. Cl.³ B63H *23/08*
U.S. Cl. 440—75 **7 Claims**



1. A marine power transmission of the type having a change speed gear system mounted in a housing and including a forward shaft, a reverse shaft and an output shaft journalled in said housing, said shafts having gears fixed thereto for rotation therewith whereby power can be transmitted through the gears of said shafts to obtain different speed ratios and directions of output shaft rotation, said forward shaft and said rearward shaft each having a friction plate type, hydraulically actuated clutch connected therewith, said forward shaft also having a friction plate type, hydraulically actuated brake concentrically mounted therearound and operatively connectible between said forward shaft and said housing whereby said forward shaft can be braked against rotation by being anchored to said housing, said forward shaft and said output shaft having a transmission gear set therebetween whereby braking of said forward shaft acts to brake said output shaft through said transmission gear set, said output shaft connected to a propeller for rotatably driving the latter in either direction of rota-

tion, said transmission also having a hydraulic control circuit connected with said clutches and said brake for actuation thereof, said circuit also including an operator controlled, forward-neutral-reverse selector valve, a shuttle valve, a brake release valve, a brake cooling valve and a clutch cooling valve for each of said clutches on said forward and reverse shafts, said selector valve being operable to actuate said clutches so that said transmission can be selectively in forward, neutral or reverse conditions of operation, said shuttle valve being actuated upon commencement of engagement of said forward shaft clutch or reverse shaft clutch to thereby direct pressure fluid flow to actuate said brake release valve and thereby causing said brake to be released, valve means for providing a priority flow of lubricant to said brake cooling valve and to said clutch cooling valves when either of the respective clutches of said cooling valves are engaged, and cuts off priority flow of lubricant to said brake.

4,451,239

HYDROPLANE APPARATUS

James M. Hoenstine, 3201 Alamo Dr., Orlando, Fla. 32805, and Thomas E. Ray, 2512 Trentwood Blvd., Orlando, Fla. 32812

Filed Sep. 27, 1982, Ser. No. 424,105
Int. Cl.³ B63B 7/08
U.S. Cl. 441—66 **4 Claims**

1. A hydroplane apparatus comprising in combination:
a pneumatic innertube;
a flexible fabric innertube cover, including an annular flexible fabric material partially covering said innertube and forming a smooth bottom thereto;
a handle attached to said cover for a rider to hold onto; and
a tow rope attaching means attached to said cover smooth bottom for attaching a tow rope for pulling said hydroplane, and including a fabric strap having each end portion thereof stitched to said fabric cover along the bottom thereof and said fabric strap being stitched to a reinforcing strap of flexible material on said cover bottom between said fabric strap end portions, whereby an inflatable hydroplane is provided using a pneumatic innertube.

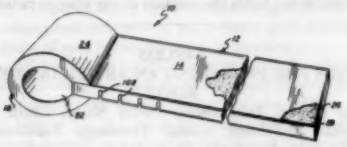
4,451,240

AQUATIC MAT

Robert L. Wood, Wichita Falls, Tex., assignor to Advanced Sports Corp., Wichita Falls, Tex.

Continuation-in-part of Ser. No. 10,201, Feb. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 743,340, Nov. 19, 1976, Pat. No. 4,138,753, which is a division of Ser. No. 609,049, Aug. 29, 1975, Pat. No. 4,006,503, which is a continuation-in-part of Ser. No. 594,018, Jul. 8, 1975, abandoned. This application May 27, 1981, Ser. No. 267,285
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.³ B63B 35/72
U.S. Cl. 441—129 **31 Claims**

1. An aquatic floatation mat capable of floating in water and supporting one or more persons, comprising an elongated planar member having top and bottom planar surfaces and a headrest secured to and extending from an end portion of said planar member; said planar member and said headrest formed from closed cell plastic foam slab members, which are flexible, resilient and non-water absorbent; said headrest slab member having ends thereof secured to an end portion of said planar member, said elongated planar member having transverse grooves formed in the elongated planar member; said grooves



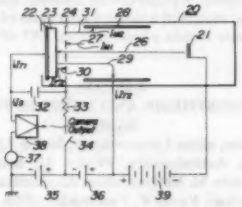
being spaced so as to enable the aquatic mat to be easily rolled up.

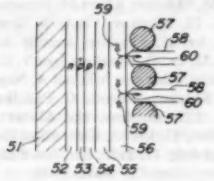
4,451,241

METHOD OF MANUFACTURING A TV CAMERA TUBE

Kazuhisa Taketoshi, and Chihaya Ogusu, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,240
Claims priority, application Japan, Jan. 29, 1981, 56/10849
Int. Cl.³ H01J 9/18
U.S. Cl. 445—33 **10 Claims**





1. In a method of manufacturing a camera tube, said camera tube comprising an envelope containing a glass faceplate and an electron gun including a cathode; an n-type transparent electrode layer; a photoconductive target formed on said n-type transparent electrode, said target being composed at least of a photoconductive layer formed by depositing a thin p^+-type layer, a p-type layer and an n-type layer in succession on said n-type transparent electrode layer; and a block layer formed on said photoconductive layer for blocking an electron beam emitted from said cathode from passing through said photoconductive layer; a metal mesh disposed in the vicinity of a side of said photoconductive target, said side being scanned by said electron beam; and a collector electrode disposed between said metal mesh and said cathode for collecting secondary electrons emitted from said photoconductive target, whereby said photoconductive target is scanned by said electron beam emitted from said cathode, the steps of:
heating said metal mesh at a temperature in a range from 80° C. to 400° C.;
rotating the heated metal mesh around a rotation axis which is perpendicular to the surface of said metal mesh at a rate

in the range of one revolution per second to ten revolutions per second;

depositing an insulation material on a surface of said metal mesh from an evaporating source disposed above said metal mesh at an angle in a range from 20 degrees to 70 degrees to form an insulated metal mesh; and

disposing the surface of said insulated metal mesh which is completely covered by the insulation material opposite to said photoconductive target.

4,451,242

METHOD OF CONVEYING PANEL AND SHADOW MASK AND PALLET FOR HOLDING PANEL AND SHADOW MASK AND APPARATUS FOR REMOVING SHADOW MASK FROM PANEL

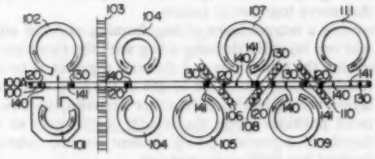
Hideo Miyazawa, and Junzo Kitamura, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,518

Claims priority, application Japan, Jun. 5, 1981, 56-85735

Int. Cl.³ H01J *9/00*; G03B *41/00*

U.S. Cl. 445—65 **11 Claims**



1. A method of conveying a panel and a shadow mask comprising the steps of:

placing on a pallet the panel holding the shadow mask therein;

conveying the pallet to a mask removing station in the vicinity of a treating device;

removing the shadow mask from the panel on the pallet and supporting the removed shadow mask in the pallet at the shadow mask removing station;

conveying the panel to the treating device to be subjected to a predetermined treatment; and

placing the panel on the pallet after being treated in the preceding step.

4,451,243

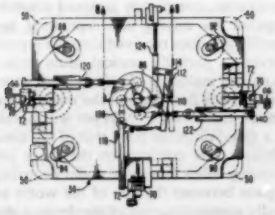
AUTOMATIC MASK-FRAME INSERTER

Frank T. D'Augustine, Lancaster, Pa.; Malcolm E. Terry, Marion, Ind.; Hugh F. Welsh, Marion, Ind., and Frank A. Payne, Marion, Ind., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 167,475, Jul. 11, 1980, abandoned. This application Jul. 20, 1982, Ser. No. 400,062

Int. Cl.³ H01J *9/20*

U.S. Cl. 445—68 **1 Claim**



1. An automatic apparatus for inserting a mask assembly into a cathode ray tube faceplace panel, said mask assembly including an apertured shadow mask having at least three springs attached thereto, each spring including an aperture, said faceplate panel including a viewing faceplate portion and a peripheral sidewall, said sidewall including at least three studs embedded therein for engagement with said spring apertures, said apparatus comprising:

means for holding said faceplate panel with the internal side down,

a vertically movable assembly located below said means for holding said faceplate panel, said vertically movable assembly including a subassembly at each mask spring location, at least three of said subassemblies each including a stop for contacting the lower edge of a mask spring, each subassembly also including a locator pin for locating said spring aperture, said locator pin being movable between an engaged position and a disengaged position, said subassemblies being horizontally movable peripherally with respect to said mask assembly to align said locator pin with said spring apertures, said locator pin when in said engaged position being spaced from said stop a predetermined spacing equal to a standard spacing between a lower edge of a spring and the centerline of the spring aperture plus a predetermined lifting distance whereby said locator pin raises said mask assembly from said stop when in said engaged position, each subassembly further including a fork-shaped stud finder centered with respect to said locator pin, and said vertically movable assembly further including means for locking the position of a mask assembly and means for depressing said mask springs, whereby when a mask assembly is mounted on said vertically movable assembly, said springs rest on said stops when said locator pin is in said disengaged position, and said horizontally movable subassembly can move horizontally to align said locator pin and said spring apertures when said locator pin moves from said disengaged position to said engaged position, and said fork-shaped stud finder engages said stud on said faceplate panel to align said stud and said spring aperture.

4,451,244

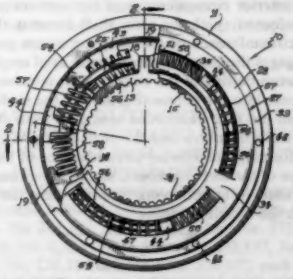
SERIES VIBRATION DAMPER WITH NON-SYMMETRICAL CURVE

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 30, 1982, Ser. No. 445,610

Int. Cl.³ F16D *3/14, 47/02*

U.S. Cl. 464—68 **12 Claims**



1. A vibration damper assembly transmitting torque between driving and driven members and allowing different damping reactions in the opposite directions of rotation, comprising an input member operatively connected to torque input means, a hub operatively connected to torque output means and having at least two radial hub arms, a pair of floating spring separators between adjacent hub arms, compression spring sets interposed between said hub arms and separators forming groups of three spring sets acting in parallel with each group of spring sets

acting in series, and a pair of cover plates substantially enclosing said hub, spring separators and spring sets and operatively connected to said input member, each cover plate having circumferentially equally spaced inwardly offset drive straps interposed in the path of the spring sets and corresponding in number to and normally axially aligned with said hub arms, the improvement comprising a curved bypass thrust member operatively connected to each hub arm and extending in one direction through a pair of adjacent spring sets and the spring separator therebetween.

4,451,245

COUPLING CONNECTION FOR A FIBER REINFORCED SYNTHETIC RESIN PIPE

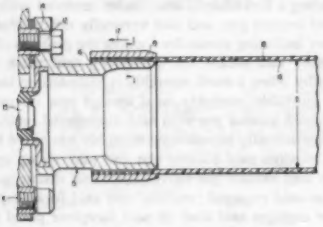
Rudolf Hörnig, Esslingen, and Günter Wörner, Kernen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,974

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007896

Int. Cl.³ B32B *5/12*; F16C *1/02*

U.S. Cl. 464—181 **21 Claims**



1. A coupling connection for fiber reinforced synthetic resin shaft, comprising a shaft having a connecting area at a distal end of the shaft, support means and coupling means for cutting the internal diameter of the fiber reinforced synthetic resin shaft, the coupling means being disposed concentrically to the shaft, the coupling means having a plurality of peripherally disposed teeth members on a circumference of the coupling means, the teeth members extending axially of the coupling means and having a circular crown diameter larger than the internal diameter of the fiber reinforced synthetic resin shaft so that the interior circumference of the connecting area of the fiber reinforced synthetic resin shaft assumes the form of a cutting circumference of the coupling means and form-lockingly engages the coupling means upon axial emplacement and simultaneous cutting of the cutting teeth members of the coupling means into the connecting area of the shaft,

wherein the fiber reinforced synthetic resin shaft is cut by the teeth members into the shaft along its circumference conforming the internal circumference of the shaft to the shape of the teeth members, thereby non-rotatably joining the shaft to the coupling means so that the shaft rotates with the coupling means.

4,451,246

MEANS AND METHODS OF MAKING BAGS WITH SPOUTS

Jesus Herrera-Gutierrez, Dallas, Tex., assignor to American Interpac Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 226,536, Jan. 19, 1981. This application Nov. 18, 1981, Ser. No. 322,512

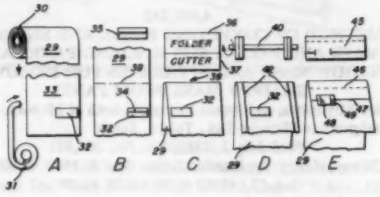
Int. Cl.³ B31B *1/90*

U.S. Cl. 493—215 **11 Claims**

1. The method of making bags formed of two adjacent flat layers sealed about the edges with an access opening thereinto in the form of a self-contained spout structure that may be selectively opened and closed manually, comprising the steps of:

positioning on one layer of a flexible bag forming material a longitudinal memory strip of a material stiffer than the flexible bag material that is manually deformable back and forth over a plurality of deforming cycles to assume resident configurations respectively for producing open and closed spout structure,

attaching the memory strip immovably along its length to



the bag layer to thereby form two adjacent unitary layers that move together in unison,

disposing a second layer of bag forming material adjacent said one layer for defining a bag with the two layers, and

attaching the two layers and the strip together at two separated positions along the length of the strip with the two layers unattached to each other between the two separated positions along the length of the strip to define thereby in a predetermined resident position related to a finished bag said access opening.

4,451,247

CONTINUOUS, COMPLETELY JACKETED, COUNTERCURRENT CENTRIFUGAL EXTRACTOR

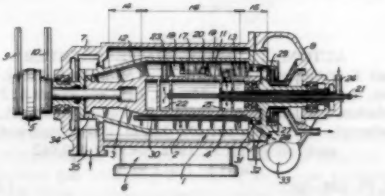
Willi Ostkamp; Karlheinz Brunner, and Friedrich Wibbelt, all of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 459,014

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202294

Int. Cl.³ B04B *1/20*

U.S. Cl. 494—52 **6 Claims**



1. In a continuous, completely jacketed countercurrent centrifugal extractor for mixing and separating two liquids of different specific gravities received through separate inlets, the extractor having a partially conical drum rotatable about a horizontal axis and including clarified-liquid zones and a mixing zone, with liquids flowing into the mixing zone from compartments inside the drum, a conveyer worm inside the drum rotatable at a speed different from that of the drum jacket and including threads that conform to the inner surface of the jacket and convey solids that settle under centrifugal force in a separation space between the hub of the worm and the drum into a conically contracting end of the drum, a skimmer inside a skimming compartment for carrying off an initial liquid phase and, a discharge space for another liquid phase that is separated from the separation space by an overflow weir and sealed off from the skimming compartment, the improvement compris-

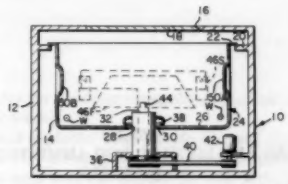
ing: at least one overflow weir in the mixing zone between the inlet for the lighter liquid phase and the inlet for the heavier liquid phase, means dividing the mixing zone into a series of mixing-and-separation compartments, means forming access channels emptying into the vicinity of the inner surface of the drum jacket and into that of the heavier phase to conduct the lighter phase out of the compartment inside the hub of the conveyor worm into the initial mixing-and-separation compartment, and means forming at least one overflow channel emptying into the vicinity of the heavier phase in the overflow weir to divert the lighter phase separated in the initial mixing-and-separation compartment into a subsequent mixing-and-separating compartment.

4,451,248

CENTRIFUGE BOWL HAVING ROTOR WINDAGE LIMITED DISPOSED THEREON

John F. Williams, New Canaan, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 20, 1981, Ser. No. 285,024
Int. Cl.³ B04B *9/10*
U.S. Cl. 494—84 **8 Claims**



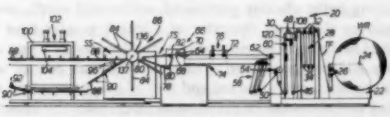
1. A container for a centrifuge comprising a sidewall and a floor, the sidewall having a first and a second inwardly directed turbulence promoter mounted thereto, each turbulence promoter having a predetermined height dimension H, a radial inward dimension R and a circumferential dimension C, the lower end of each of the promoters being disposed at a predetermined operative height above the floor so that a substantial portion of each turbulence promoter is radially adjacent to a centrifuge rotating element receivable within the container, the dimensions H, R and C and the operative height of each turbulence promoter being selected such that each turbulence promoter is sized so as to disrupt air flow generated within the container by the rotation of the rotating element to cause fluid friction effects whereby the speed at which the rotating element may rotate is windage limited.

4,451,249

MANUFACTURE OF THERMOPLASTIC BAGS

René F. deBin, Denderstraat 54, B-9300 Aalst, Belgium

Filed Sep. 21, 1981, Ser. No. 304,405
Claims priority, application Belgium, Sep. 26, 1980, 2/58774; United Kingdom, Mar. 18, 1981, 810423
Int. Cl.³ B31B *23/14, 1/98*
U.S. Cl. 493—204 **17 Claims**



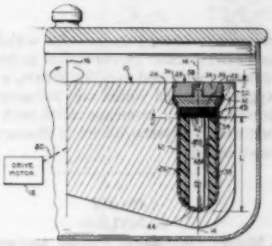
1. A method of making thermoplastic bags from a web roll of thermoplastic material which is continuously unwound and divided by a sealing and severing device along equally longitudinally spaced lines transverse to its direction of movement to thereby produce web segments of equal dimensions, the improvement comprising punching at least one hole closely adjacent to and on either side of the longitudinal median of the web before division occurs at intervals such that each resulting web segment contains at least two holes, transferring and accumulating each segment as it is produced on a support including posts projecting through said holes and supporting a central portion of the segments such that the remaining portions of the accumulated segments drape downwardly, and cutting an accumulated group of segments along a line substantially central of each segment and between the holes while on the support and thereby produce two bag stacks from the accumulated web segments.

4,451,250

INSIDE ADAPTER FOR A SAMPLE CONTAINER

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1982, Ser. No. 424,474
Int. Cl.³ B04B *7/00*
U.S. Cl. 494—85 **17 Claims**



1. An adapter for a container used for centrifugation of a sample, the container having a predetermined configuration on the interior surface thereof, the adapter having an external surface sized for receipt within the container, the lower end of the adapter being configured to conform to the configuration of the bottom of the container, the adapter further having a bore extending through a portion thereof, the bore having a first radially inner and a second radially outer surface connected by generally confronting first and second planar surfaces, the bore defining a volume adapted to receive a sample therein, the adapter being arranged to support the container from the interior surface thereof as the container is subjected to a centrifugal force field.

4,451,251

STROKE TREATMENT UTILIZING EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor Township, Delaware County, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

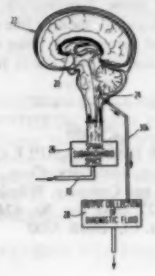
Division of Ser. No. 354,346, Mar. 3, 1982, Ser. No. 275,116, Jun. 18, 1981, Pat. No. 4,393,863, and Ser. No. 275,117, Jun. 18, 1981, said Ser. No. 275,116, and Ser. No. 275,117, each is a division of Ser. No. 139,886, Apr. 14, 1980, said Ser. No. 354,346, is a continuation-in-part of Ser. No. 139,886,. This application Sep. 30, 1982, Ser. No. 428,899
The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.
Int. Cl.³ A61K *31/00*; A61M *5/14*
U.S. Cl. 604—24 **21 Claims**

1. An apparatus for treating patients suspected of having hypoxic-ischemic central nervous system tissue, comprising:

(a) a reservoir containing an oxygenatable fluorocarbon emulsion for treating hypoxic-ischemic neurologic tissue;

(b) oxygenator means disposed in fluid communication with said reservoir for oxygenating said emulsion, to produce an oxygenated liquid;

(c) cerebrospinal injection means disposed in fluid communication with said oxygenator means for injecting said oxygenated liquid into an extravascular cerebrospinal body pathway;



(d) cerebrospinal withdrawal means for withdrawing liquid from said extravascular cerebrospinal pathway to create, in combination with said injection means, a circulation of said oxygenated liquid within said pathway; and

(e) monitoring means in communication with said pathway for monitoring a physical/chemical characteristic of said withdrawn liquid.

4,451,252

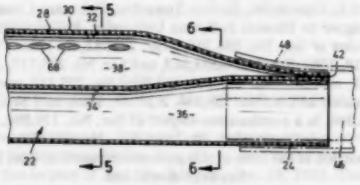
CANNULA

Geoffrey S. Martin, Mississauga, Canada, assignor to Vas-Cath of Canada Limited, Mississauga, Canada

Filed Jul. 24, 1981, Ser. No. 286,589

Int. Cl.³ A61M *5/00, 25/00*

U.S. Cl. 604—43 **2 Claims**



1. A flexible cannula for providing two discrete flows of blood when in position, the cannula comprising: an elongate portion having an outer wall and an integral septum extending between two locations on the outer wall to divide the portion into first and second lumens of similar cross-section; means coupled to the lumens at a first end of the elongate portion to provide flow into the first lumen and to receive flow from the second lumen; a first portion adjacent the other end of the elongate portion providing flow out of the free end of the first lumen at an end portion thereof and a second portion adjacent the other end of the elongate portion to enable flow into the free end of said second lumen displaced along the longitudinal axis of the cannula toward the first end, the first portion being rounded and formed by deforming the septum into a generally semi-cylindrical shape and deforming a part of the outer wall into a complementary semi-cylindrical shape into sealing engagement with the septum to complete the rounded shape of the end portion of the first lumen, said rounded shape having a circumference less than the circumference of the cannula in the elongate portion and having at least part of its peripheral wall increased in thickness around the circumference to rigidify the end portion so that deformation of the first lumen is minimized during insertion of the end portion into a blood vessel.

4,451,253

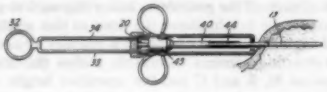
MEANS AND METHOD FOR ADMINISTERING MEDICINALS

Sherman M. Harman, 9302 Michaels Way, Ellicott City, Md. 21043

Continuation-in-part of Ser. No. 217,780, Dec. 18, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,136

Int. Cl.³ A61M *5/18*

U.S. Cl. 604—60 **3 Claims**



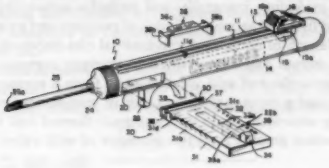
1. A device for effecting the subcutaneous implacement of a solid pellet medicament comprising: an elongated rigid guide element including a first relatively fixed member and a second member slidably associated with said first member, said first member having manually engageable means and an abutment means thereon; said second member having first and second ends, manually engageable means located substantially at said first end, and cartridge engaging means on said second end; an elongated single use disposable cartridge including a hollow needle member having a first free end and a second end having a hub, said hub having an engaging means thereon corresponding to said cartridge engaging means on said second member, and selectively engaged therewith; an elongated medicament-containing pellet slidably positioned within said needle member, and an elongated obturator of a length greater than the length of said needle member, said obturator having a first end initially slidably positioned within said second end of said needle member, and a second end free of interconnection and abutting said abutment on said first member; whereby upon the subcutaneous insertion of said free end of said needle member, said pellet is positioned within the body of a patient; by movement of said second member in a given direction relative to said first member to withdraw said needle member, said obturator preventing movement of said pellet; said cartridge including said obturator being disposable after a single use.

4,451,254

IMPLANT SYSTEM

Harold B. Dinius, and John R. Huizenga, both of Mooresville, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 15, 1982, Ser. No. 358,459
Int. Cl.³ A61M 5/18
U.S. Cl. 604—62 12 Claims



1. Apparatus for inserting elongated cylindrical implants in animals, comprising

an elongated implanter body having forward and rearward portions and defining a central bore, an elongated slot between such bore and an outer surface of the body and a transverse cartridge-receiving opening in the forward portion of the body and intersecting such bore,

an implant tube having a sharpened forward end and means to mount such tube to the forward end of the body in alignment with said central bore,

a plunger including an elongated rod slidable in the central bore between a rearward position in which its forward end is behind the cartridge-receiving opening and a forward position in which it extends into the implant tube to expel an implant therefrom, said plunger having a web extending through said slot and supporting a thumb-engageable surface outside said body for engagement by the thumb of an operator for moving the plunger between its two positions,

a cartridge removably mounted in said cartridge-receiving opening and containing a plurality of implants in side-by-side relationship and parallel to said central bore, and means for moving said implants successively into alignment with said central bore of the body for movement by the plunger forwardly through the implant tube,

means adjacent the rear of the slot for engaging said web to retain the plunger in a retracted position behind an implant moved from said cartridge into alignment with said bore,

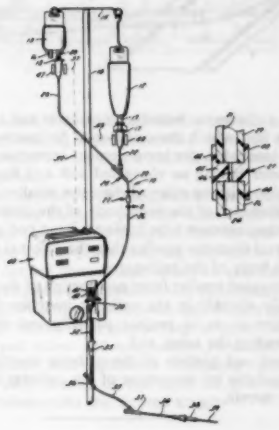
one of said implanter body and said plunger web having a laterally extending tooth surface thereon and the other having a tooth-engaging surface thereon to interengage such tooth surface intermediate the travel of the plunger to impede the movement of the plunger at an intermediate position in which its forward end lies within the implant tube and spaced rearward of its sharpened forward end a distance approximately equal to the length of an implant so as to position an implant substantially at such forward end of the tube for delivery therefrom, said interengaging tooth and tooth-engaging surfaces being disengageable and said plunger being movable beyond said intermediate point by thumb pressure on said thumb-engageable surface to expel such implant from the tube into an animal when the tube has been inserted through the skin of the animal.

4,451,255

DUAL FLOW RATE INTRAVENOUS ADMINISTRATION SET WITH SINGLE PUMP CHAMBER

Albert F. Bujan, Waukegan, and Jack L. Harms, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 20, 1982, Ser. No. 379,823
Int. Cl.³ A61M 5/00
U.S. Cl. 604—157 11 Claims



1. An intravenous administration set for pumping liquid from at least two separate source by means of a single pumping device comprising:

a pump chamber having inlet and outlet ports in communication with a cavity portion with means to vary the volume of said cavity to effect a flow of liquid from said inlet port and out said outlet port;

first and second lengths of flexible I.V. tubing in fluid-tight communication with said inlet and outlet ports, respectively;

means to attach an intravenous needle connected to said second length of tubing opposite said chamber;

third and fourth lengths of flexible I.V. tubing;

container connection means operatively associated with said third and fourth lengths of flexible tubing;

backcheck valve means including a valve body with interconnected fluid passage means for fluid-tight communication with said first, third and fourth lengths of flexible tubing, said valve body including liquid flow control means to selectively control the flow of liquid in said one of said third and fourth lengths of tubing in response to liquid flow in the other; and

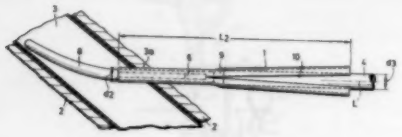
flow restriction or interruption means defined by a body section with a flow passage operatively connected to said first length of tubing and positioned between said backcheck valve means and pump chamber to restrict or interrupt fluid flow therein,

so that when the volume of said pump chamber cavity is reduced by a pumping device, any reduction in pressure will not be transmitted through said first length of tubing to said backcheck valve means.

4,451,256
CATHETER SET

Andreas Weikl, and Max Hubmann, both of Erlangen, Fed. Rep. of Germany, assignors to Intermedicat GmbH, Switzerland

Filed Apr. 28, 1982, Ser. No. 372,739
Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117802
Int. Cl.³ A61M 5/00
U.S. Cl. 604—164 15 Claims



1. In a catheter set including a catheter and a catheter insertion tube into which the catheter to be inserted into a blood vessel is insertable, the improvement comprising:

a catheter having an elongated soft and flexible front end portion with an external diameter smaller than the external diameter of the main body of the catheter;

a catheter insertion tube having a front end portion with an internal diameter smaller than the external diameter of the main body of the catheter;

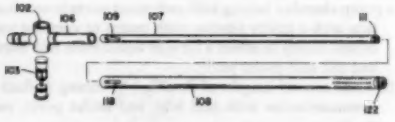
the elongated smaller front end portion of the catheter being axially slidable in the catheter insertion tube front end portion so as to project partially out thereof without expanding the same; and

the front end portion of the catheter insertion tube being expandable by movement of the catheter main body axially therein.

4,451,257
SURGICAL ASPIRATOR WITH POPPET CONTROL VALVE

Frank W. Atchley, P.O. Box 2730, Napa, Calif. 94558

Filed Oct. 29, 1981, Ser. No. 316,297
Int. Cl.³ A61M 1/00
U.S. Cl. 604—119 3 Claims

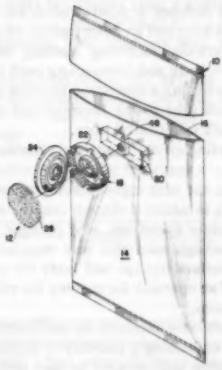


1. A vacuum aspirator, comprising handle means connected to a vacuum source, aspirator tip means extending from said handle means, and poppet valve means disposed between said aspirator tip means and said vacuum source to selectively establish or break flow communications therebetween, said handle means including a handle member extending longitudinally, a vacuum passageway extending longitudinally through said handle member along a first axis, said poppet valve means including a valve bore extending through said handle member along a second axis and intersecting said vacuum passageway, said first and second axes being generally orthogonal, said poppet valve means further including a generally cylindrical poppet slidably retained in said valve bore and received therein at any rotational angle about said second axis of said bore, said poppet being formed in integral, one-piece construction, said poppet further including a valve port extending therethrough, said poppet being slidably translatable in said valve bore to selectively dispose said valve port in flow communication with said vacuum passageway and said aspirator tip means, said poppet including seal means for securing said poppet in said valve bore in slidable, sealing fashion, said poppet including a first resilient cylindrical portion and a second resilient cylindrical portion, said first and second portions being axially spaced apart to define a fixed spacing therebetween, said valve port extending through said fixed spacing, a valve pin extending generally parallel to said second axis between said first and second portions to maintain said fixed spacing, said valve pin being radio-opaque, said seal means including a plurality of annular ribs formed integrally with and protruding radially outwardly from said poppet and spaced axially therealong, a pair of said annular ribs being disposed at opposed ends of each of said first and second portions and adapted to compressively engage the inner surface of said valve bore in pressure-sealing fashion, said seal means further including a plurality of longitudinal ribs extending integrally and radially outwardly from each of said first and second cylindrical portions and extending the entire length of each, said longitudinal ribs disposed parallel to said second axis and adapted to impinge compressively on the inner surface of said valve bore to form a pressure seal therewith, said poppet including a pair of stop flanges extending radially outwardly from opposed ends thereof and having outer diameters greater than the diameter of said valve bore.

4,451,258
OSTOMY BAG WITH AN ADJUSTABLE VENT

Ole R. Jensen, Rivervale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 4, 1982, Ser. No. 354,772
Int. Cl.³ A61F 5/44
U.S. Cl. 604—333 15 Claims



1. In combination, an ostomy bag, having an interior portion, and a vent therefor, said vent comprising a housing; an interior chamber within said housing; a plug extending outwardly from said housing; filtering means in said interior chamber of said housing for filtering gas flowing through said housing; permitting means for permitting gas in said ostomy bag to flow through said housing to the atmosphere, said permitting means including said interior chamber of said housing, at least one opening provided in an outer edge of said housing and communicating with said interior chamber of said housing and a passageway provided in said plug and communicating with said interior chamber of said housing; coupling means fixed to said ostomy bag for releasably coupling said housing to said ostomy bag, said coupling means including a channel which is in constant communication with said interior portion of said ostomy bag and receiving means for releasably receiving said plug of said housing such that in a first position said passageway in said plug communicates with said channel in said coupling means, whereby gas in said interior of said ostomy bag may flow through said housing to the atmosphere, and in a second position said passageway in said plug does not communicate with said channel in said coupling means, whereby gas in said interior of said ostomy bag may not flow through said housing to

the atmosphere; and adjusting means for adjusting the rate of gas flow through said housing.

4,451,259

BLOOD STORAGE METHOD

Ulrich C. Geissler, Cary; Gerald A. Grode, Grayslake; William J. Stith, and Ronald A. Williams, both of Mundelein, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 955,060, Oct. 26, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,469

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.³ C08K 5/11

U.S. Cl. 604—408 **18 Claims**

1. The method which comprises storing blood for a period of days in a container made from a blood-compatible polymer, said polymer comprising a sterilizable, flexible, chlorine-free plastic material which contains sufficient antihemolytic agent dispersed therethrough to cause a reduced plasma hemoglobin content of the blood stored in contact therewith for 21 days, when compared with blood stored for a similar period of time in contact with the same blood-compatible material free of said antihemolytic agent, said antihemolytic agent comprising a fatty ester containing 2 ester linkages comprising fatty aliphatic hydrocarbon groups of 4 to 12 carbon atoms each, attached to a hydrocarbon chain and separated by no more than 7 carbon atoms.

4,451,260

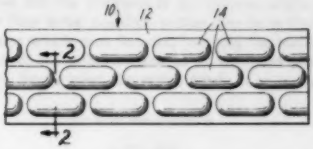
SUSTAINED RELEASE ORAL MEDICINAL DELIVERY DEVICE

Sumita B. Mitra, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 26, 1982, Ser. No. 362,116

Int. Cl.³ A61K 9/22

U.S. Cl. 604—890 **20 Claims**



1. A flexible, sheet-like, sustained release medicament device for orally administering a predetermined selective dose of a medicament, which device is of a multi-layer composite construction comprising

(a) at least one dry, self-supporting carrier film comprising at least one water-insoluble polymer matrix and containing medicament dispersed or dissolved therein, and

(b) at least one barrier film overlaying said carrier film on at least one surface thereof and sealed to said carrier film along its periphery and in such a way as to entrap a plurality of small pockets of air between said carrier and barrier films, said barrier film comprising at least one water-insoluble and water- and medicament-permeable polymer or copolymer, said multilayer composite construction having a bulk density of less than 1.0 g/cc and being facilely divisible into any desired length.

4,451,261

PREPARATION OF LUBRICATING AGENTS FOR LEATHERS AND FURS

Wolf-Dieter Willmund, Düsseldorf; Manfred Biermann, Mühlheim; Horst Baumann, Leichlingen; Hans-Herbert Friese, Monheim, and Friedrich Pieper, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,636

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238741

Int. Cl.³ C14C 9/02

U.S. Cl. 8—94.22 14 Claims

1. A process for the preparation of sulfonated lubricating agents for leather and tanned furs consisting of the steps of:

(a) chlorinating natural or synthetic higher fatty acids or esters of higher fatty acids having chain lengths of from 8 to 24 carbon atoms containing olefinically unsaturated fractions, up to saturation of the double bonds;

(b) sulfochlorinating the chlorinated product from step (a) with chlorine and SO_2 at a temperature of from about 20° to 90° C., optionally under UV-radiation, for a time sufficient to obtain a compound having a chlorine content of from about 5 to 30 percent by weight and a content of SO_2Cl groups of from about 1 to 20 percent by weight, the ratio of chlorine atoms to SO_2Cl groups being from about 0.7:1 to 70:1; and

(c) saponifying the product from step (b) to form a water-emulsifiable alkali metal, ammonium, or lower alkyl-ammonium salt of the product of step (b).

4,451,262

AFTER-TREATMENT OF FINISHED, CELLULOSE-CONTAINING FIBROUS MATERIALS WITH LIQUID AMMONIA

Fritz Mayer, Weil am Rhein, Fed. Rep. of Germany, and Svein Holtermann, Oslo, Norway, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 138,067, Apr. 7, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,724

Claims priority, application Switzerland, Jul. 16, 1979, 6607/79

Int. Cl.³ D06M 13/28, 13/32, 13/44, 11/14

U.S. Cl. 8—125 19 Claims

1. A process for flame-proofing cellulose-containing fibrous material which comprises the steps of

(a) applying an aqueous composition which contains 200 to 400 g/l of at least one flameproofing agent selected from the group consisting of methylolated phosphonium salts phosphonium hydroxides, their water-soluble condensation products with a compound which forms an aminoplast, methylolated alkylphosphonocarboxamides and their water-soluble polymers with a compound which forms an aminoplast, and 20 to 100 g/l of a compound which forms an aminoplast or of an aminoplast precondensate to the fiber and fixing,

(b) washing and drying the material and

(c) subjecting the material thus obtained to an aftertreatment with liquid ammonia.

4,451,263

PROCESS FOR DYEING AND FINISHING TUBULAR TEXTILE MATERIAL: ALIGNMENT OF FLATTENED EDGES DISPLACED TO AVOID EDGE MARKINGS

Peter Oppitz, Kelkheim; Manfred Schulze-Braucks, Hofheim am Taunus, and Rolf Tesche, Glashütten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,675

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146431

Int. Cl.³ D06B 1/10, 3/18, 15/02

U.S. Cl. 8—500 10 Claims

1. A process for uniformly applying a liquor containing a treatment agent when dyeing and/or finishing textile material in the form of a fabric tube by padding and squeezing off excess liquor on a pad mangle, comprising impregnating the fabric tube with the treatment liquor, spreading out the treated fabric tube in the moist state, squeezing the spread out moist fabric tube on the pad mangle to achieve a liquor pick-up of at least 60% relative to the dry weight of the fabric tube, resulting in forming squeeze edges on opposite side edges of the spread out, squeezed fabric tube, immediately thereafter moving the fabric tube so that the positions of the squeeze edges are displaced from their initial positions so that they lie in that part of the fabric tube which runs flat, and batching the textile material thus treated for sufficient time in its displaced position to level out the liquor over the entire fabric tube by capillary action.

4,451,264

SURFACE COLORING OF POLYVINYL RESINS

Donald C. Ulry; Charles G. Cosner, and Thomas D. Ryan, all of Escondido, Calif., assignors to Formulabs Industrial Inks, Inc., Escondido, Calif.

Filed Sep. 27, 1982, Ser. No. 424,058

Int. Cl.³ D06P 5/00

U.S. Cl. 8—508 8 Claims

1. A process for the coloring of water insoluble, organic solvent resistant, electrical insulator polyvinyl resins which process comprises:

(A) contacting a surface area of said polyvinyl resin with a liquid, nonflammable, halogenated hydrocarbon solvent having 1–2 carbon atoms where halogen is chlorine, fluorine or both, and

a solvent dye dissolved in said solvent;

(B) at about room temperature for a time sufficient to color said surface area; and

(C) removing residual solvent from said surface area.

4,451,265

DIESEL FUEL-AQUEOUS ALCOHOL MICROEMULSIONS

Arthur W. Schwab, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 21, 1981, Ser. No. 256,206

Int. Cl.³ C10L 1/32

U.S. Cl. 44—51 10 Claims

1. A hybrid fuel composition comprising:

(a) a diesel fuel;

(b) a lower (C_1–C_3) alcohol;

(c) water; and

(d) a surfactant system comprising the reaction product of N,N-dimethylethanol amine and a long-chain fatty acid substance selected from the group of monocarboxylic acids having a chain length of C_9–C_{22} and mixtures thereof in an amine:fatty acid substance molar ratio of about 2:1 to 1:2,

wherein said surfactant system is present in the fuel composition in an amount effective for said composition to exist as a thermodynamically stable microemulsion.

4,451,266

ADDITIVE FOR IMPROVING PERFORMANCE OF LIQUID HYDROCARBON FUELS

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Filed Jan. 22, 1982, Ser. No. 341,705

Int. Cl.³ C10L 1/18

U.S. Cl. 44—53 10 Claims

1. An additive composition to be added to liquid hydrocar-

bon fuels in a range from about 1/2000 to about 1/500 parts additive to fuel, consisting essentially of, on a volume/volume basis:

(a) 3–10% of an alcohol of not more than 4 carbon atoms;
(b) 5–15% of an aliphatic ester not more than 6 carbon atoms;
(c) 3–13% of an aromatic hydrocarbon;
(d) 3–13% of a halogenated alkene;
(e) 35–70% of a hydrocarbon with a 50% boiling point between 115° C. and 182° C.; and
(f) 20–30% of a hydroxy substituted, unsaturated acid.

4,451,267

MICROEMULSIONS FROM VEGETABLE OIL AND AQUEOUS ALCOHOL WITH TRIALKYLAMINE SURFACTANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES

Arthur W. Schwab, and Everett H. Pryde, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 427,229
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—53 **8 Claims**

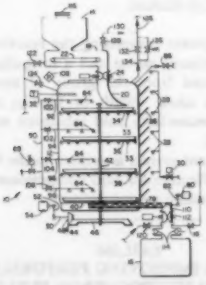
1. A hybrid fuel composition comprising:
(a) a vegetable oil;
(b) a lower (C_1–C_3) alcohol;
(c) water; and
(d) a surfactant system comprising a trialkylamine or a reaction product of a trialkylamine and a long-chain fatty acid substance;
wherein said trialkylamine is selected from the group consisting of trimethylamine, triethylamine, tripropylamine, and tributylamine; and
wherein said surfactant system is present in the fuel composition in an amount effective for said composition to exist as a thermodynamically stable microemulsion and the combined amounts of lower alcohol, water, and surfactant system relative to said vegetable oil are sufficient to impart to said composition a kinematic viscosity in the range of 2–9 centistokes at 37.8° C.

4,451,268

DRY ACETYLENE GENERATOR

John A. Lerch, 139 Norvell Dr., Signal Mtn., Tenn. 37377

Filed Sep. 29, 1982, Ser. No. 428,486
Int. Cl.³ C10H *3/00, 21/00, 21/08, 21/16*
U.S. Cl. 48—3 A **15 Claims**



1. An acetylene generator for converting calcium carbide into acetylene gas and dry hydrated lime comprising a vertically extending substantially cylindrical housing, a plurality of shelves mounted in the housing in axially spaced apart disposition, stirring means associated with each shelf, each said stirring means comprising a plurality of radial arms, means for rotating the arms of each stirring means in a first direction, each shelf including a radial exit slot extending vertically therethrough, the slot in each shelf being angularly offset relatively to the slot in each adjacent shelf, water spray means disposed above each shelf for spraying a controlled amount of water onto the respective shelf at a spray zone displaced angularly in the first direction from the corresponding slot, means for depositing calcium carbide on the top shelf in a deposit zone intermediate the top shelf slot and spray zone, whereby calcium carbide deposited on the top shelf is swept by the stirring means associated therewith through and wetted by the water being sprayed thereon and the resultant mixture is subsequently swept into the top shelf slot and discharged onto the next adjacent shelf in a deposit zone intermediate the slot and the water spraying zone of said next adjacent shelf, the mixture thereafter being discharged into a deposit zone on each successive shelf in seriatim and swept by the corresponding stirring means into the respective slot, the deposit zone of each shelf being intermediate the slot and spray zone in the respective shelf, means for conveying the residue from the lowermost shelf to a lime storage bin, and means for drawing the gas to an acetylene storage means.

11. A method of generating acetylene from calcium carbide in a plurality of stages while leaving a substantially dry lime residue, said method comprising providing a vertically extending generator having a plurality of vertically spaced shelves, depositing the calcium carbide in a deposit zone on a first shelf at the upper portion of the generator, sweeping the calcium carbide in a circular path from said deposit zone to a wetting zone, spraying water on the surface of said calcium carbide in the wetting zone, continuing to sweep the mixture of calcium carbide and water in said path to mix and permit chemical reaction of the compounds, dropping the mixture onto a shelf in the next stage prior to the mixture reaching the first shelf deposit zone, continuing the process in the subsequent stages, wherein the mixture is wetted in each stage, until a substantially dry lime residue remains, removing the residue, and removing the acetylene.

4,451,269

POLISHING COMPOSITION FOR CENTRIFUGAL MAGNETIC-ABRASIVÆ MACHINES

Boris G. Makedonski, and Haralampi A. Atanassov, both of Sofia, Bulgaria, assignors to Centralen Mashinostroitelen Institute, Sofia, Bulgaria

Filed Jan. 18, 1983, Ser. No. 458,897
Claims priority, application Bulgaria, Jan. 18, 1982, 55024
Int. Cl.³ C09K *3/14*
U.S. Cl. 51—303 **6 Claims**

1. A polishing composition for centrifugal magnetic-abrasive machines intended for machining complexed profiled workpieces, comprising: a mixture of abrasive grains and iron powder; a mixture of chromium sesquioxide, stearine, and oleic acid; ground fruit pits or sawdust; and a 3% aqueous solution of triethanolamine soap.

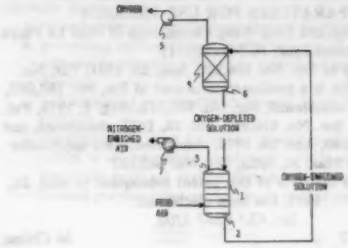
4,451,270

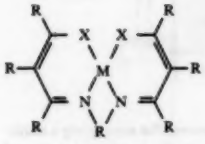
ABSORPTION PROCESS FOR PRODUCING OXYGEN AND NITROGEN AND SOLUTION THEREFOR

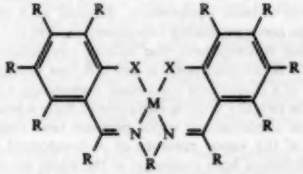
Ian C. Roman, Bend, Oreg., assignor to Bend Research, Inc., Bend, Oreg.

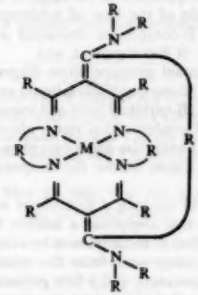
Filed Jun. 30, 1982, Ser. No. 393,711
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—38 **35 Claims**

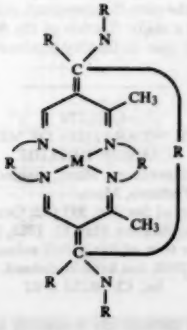
1. A process for the separation and purification of oxygen and nitrogen comprising:
(a) bringing an atmospheric air feed stream into contact with a solution containing a solvent or solvent mixture, an axial base and an oxygen carrier, said solvent or solvent mixture being capable of dissolving the axial base and the oxygen carrier when they are present together, said axial base being capable of providing a coordinating atom to the oxygen carrier, and said oxygen carrier being a metal-containing complex having any of the structures











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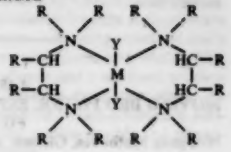
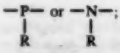


wherein

M is a metal selected from cobalt, iron, copper, nickel, manganese, ruthenium or rhodium;

X is —O—, —S—,



R is hydrogen, alkyl, aryl, halogen, alkoxy or a nitrogen-containing moiety; and

Y is halide, nitrate, thiocyanate or cyanide;

said solution absorbing oxygen from said atmospheric air feed stream;

(b) collecting nitrogen from the atmospheric air feed stream after the oxygen has been absorbed;

(c) desorbing oxygen from said solution to a gaseous product stream; and

(d) collecting oxygen from the product stream after the oxygen has been desorbed.

4,451,271

METHOD OF SEPARATING LIQUID DROPS FROM OFF GAS

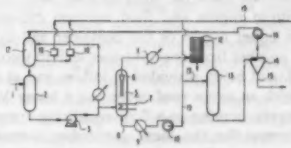
Satoshi Yamamoto; Osamu Hase, and Tamostu Kawata, all of Ibaragi, Japan, assignors to Yukamelamin Company, Limited, Ibaragi, Japan

Filed Apr. 1, 1982, Ser. No. 364,272

Claims priority, application Japan, Apr. 2, 1981, 56-49693

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—84 **8 Claims**



1. A method for separating liquid drops of molten urea, the thermal decomposition product of urea or a mixture of molten urea and its thermal decomposition product from a melamine synthesis off gas using at least two gas-liquid separators by alternately passing off gas to a separator to separate liquid drops of urea or the thermal decomposition product of urea or a mixture of urea and its decomposition product wherein each of said separators has a collecting element, a means for ingress and egress for said molten urea, said thermal decomposition product, or said mixture, and said off gas, wherein at least one gas-liquid separator is on-stream, and at least one gas-liquid separator is off-stream where the off gas has been freed of melamine, which comprises supplying the off-stream gas-liquid separator with molten urea or a molten mixture of urea and its thermal decomposition product, hereinafter collectively referred to as molten mass, and allowing said molten mass to remain in the separator and at the same time providing a turbulent means for said molten mass to flow within said off-stream gas-liquid separator and then discharging said molten mass from said separator thereby removing said liquid drops from

said separator by said drops having been contacted by said molten mass.

4,451,272

MOVING BED FILTER, ESPECIALLY AN ADSORPTION FILTER

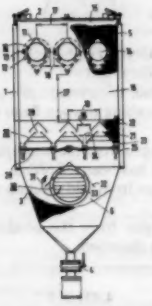
Wolfgang Mathewes, Giessen, and Peter W. Hayn, Berlin, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 462,012

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202845; Aug. 3, 1982, 3228984

Int. Cl.³ B01D *53/08*

U.S. Cl. 55—390 **20 Claims**



1. Moving bed filter for purifying a fluid medium formed of gas and/or vapor, the filter having a flow of loose particulate material downwardly from above, and a continuous flow upwardly from below of a fluid medium to be filtered, and including a container filled with the loose particulate material and having at least one closeable inlet opening at the top thereof for introducing the loose particulate material, and a downwardly tapering bottom having a closeable outlet port for discharging the loose particulate material, fluid-medium inlet ports disposed in a bottom region and fluid medium exhaust tubes arranged in an upper region of the container and extending parallel to one another from one container wall to the opposite container wall, and being provided at inflow and at outflow sides thereof with an upper roof cover and a lower V-profile cover, respectively, serving as a flow-equalizing symmetrical flow guide element for the loose particulate material, and additional components disposed in the lower region of the container in the form of a support grate for equalizing flow behavior of the loose particulate material over the whole cross section of the container, comprising a downwardly directed V-shaped cover of sieve-like construction connected at each fluid-medium exhaust tube to the upper cover thereof forming a roof-shaped symmetrical flow-guide element, the upper covers being spaced a distance of four to ten times the width of the roof gap between each two adjacent flow guide elements and between a flow-guide element and the container wall, respectively, roof edges of each upper cover projecting beyond the respective downwardly directed V-shaped cover, the support grate being formed of bipartite louver-like symmetrical roofs disposed vertically below each fluid-medium exhaust tube and parallel thereto in a manner that the mutual spacing of the axes thereof is four to ten times the width of the lower roof gaps between each two adjacent louver-like roofs and between a louver-like roof and the container wall, respectively, and sliders disposed at the underside of the support grate for closing the lower roof gaps between the louver-like roofs, said sliders being coupled with one another.

4,451,273

DISTILLATIVE FREEZING PROCESS FOR SEPARATING VOLATILE MIXTURES AND APPARATUSES FOR USE THEREIN

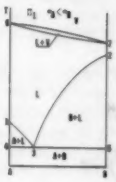
Chen-Yen Cheng, and Sing-Wang Cheng, both of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Continuation of Ser. No. 296,130, Aug. 25, 1981, Pat. No. 4,378,984, which is a continuation-in-part of Ser. No. 181,002, Aug. 22, 1980, abandoned, Ser. No. 930,312, Aug. 2, 1978, Pat. No. 4,218,893, Ser. No. 816,852, Jul. 18, 1977, abandoned, and Ser. No. 676,640, Apr. 13, 1976, abandoned. This application Mar. 31, 1983, Ser. No. 480,932

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.³ F25J *3/00*

U.S. Cl. 62—12 **36 Claims**



1. A crystallization separation process for separating a multicomponent mixture that is at least partly in a liquid state and has two key volatile components, denoted as A-component, that volatile noncrystallizing component present in the greatest amount, and B-component, the volatile crystallizing component, into a B-enriched portion and a B-lean portion through formation of a B-enriched solid mass, comprising a determination that the two key volatile components form a binary system

(a) whose characteristic vapor pressure ratio defined as the ratio of the vapor pressure of A-component to that of B-component both evaluated at the triple point temperature of B-component is in the range of 0.1 to 10 and is less than the ratio of the heat of sublimation to the heat of melting of B-component evaluated at the triple point temperature of B-component, and

(b) whose constant pressure phase diagram that includes a three phase (B-enriched solid, liquid and vapor) state has a two phase (B-enriched solid and vapor) region covering a substantial concentration range above the temperature of the three phase state and a two phase (B-enriched solid and liquid) region below the temperature of the three phase state,

and a first step of forming a first vapor mixture and a first condensed mass that comprises a mother liquor and a solid phase mass enriched in B-component by concurrently vaporizing the volatile components from the mixture in a first zone under a first temperature and a first pressure that are respectively lower than the triple point temperature and the triple point pressure of the pure B-component, and a second step of separating at least a major fraction of the A-component from the first condensed mass to thereby produce a B-enriched first condensed mass.

4,451,274

DISTILLATIVE SEPARATION OF METHANE AND CARBON DIOXIDE

John V. O'Brien, Shrewsbury, Mass., assignor to Koch Process Systems, Inc., Westboro, Mass.

Continuation-in-part of Ser. No. 307,672, Oct. 1, 1981, Pat. No. 4,383,842. This application May 12, 1983, Ser. No. 493,791

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ B25J *3/02*

U.S. Cl. 62—17 **21 Claims**

1. A method of distillatively separating a feed stream con-

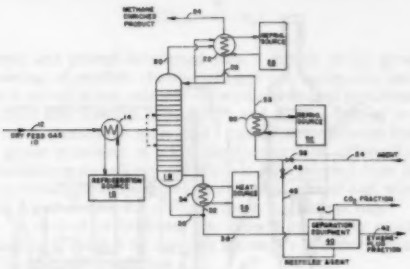
taining methane and carbon dioxide into an overhead product enriched in methane and a bottoms product enriched in carbon dioxide, comprising:

a. introducing said feed stream into a distillation column;

b. providing sufficient heat to the bottom of said distillation column to provide a bottoms product enriched in carbon dioxide;

c. withdrawing an overhead stream from the top of said column;

d. condensing at least a portion of said overhead stream for reflux in an overhead condenser at a temperature above the triple point of carbon dioxide and directing said condensed portion of overhead back to said column as reflux,



said condensed portion being sufficient to provide a column overhead enriched in methane;

e. introducing a non-polar agent miscible with methane directly into the said overhead condenser of said distillation column in a quantity sufficient to maintain the temperature in the said condenser and at all locations within the distillation column above the triple point of carbon dioxide;

f. withdrawing that portion of the overhead stream not employed as reflux as overhead product enriched in methane; and,

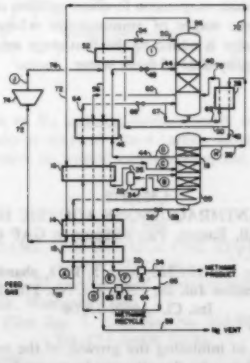
g. withdrawing a bottoms product enriched in carbon dioxide.

4,451,275

NITROGEN REJECTION FROM NATURAL GAS WITH CO_2 AND VARIABLE N_2 CONTENT

Harvey L. Vines, Emmaus, Pa. and Vincent Marano, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 27, 1982, Ser. No. 382,738
Int. Cl.³ F25J *34/02*
U.S. Cl. 62—28 **17 Claims**



1. In a cryogenic nitrogen rejection process for a natural gas feed stream comprising a double distillation cycle having a high pressure distillation stage and a low pressure distillation stage, the feed stream being introduced into the high pressure distillation stage wherein a nitrogen containing overhead and a hydrocarbon-containing bottoms are maintained while yielding a waste nitrogen overhead stream and a methane product bottoms stream from the low pressure distillation stage, the method for treating a natural gas feed stream containing variable amounts of methane, nitrogen, carbon dioxide and ethane-plus hydrocarbons which comprises

(a) removing a vapor methane stream from the bottoms of the low pressure distillation stage and warming it to ambient temperature,

(b) compressing the vapor methane stream and condensing at least a portion of the compressed methane stream against the waste nitrogen overhead stream from the low pressure distillation stage,

(c) expanding the condensed methane stream through a valve and combining it with the methane bottoms of the low pressure distillation stage to provide additional refrigeration to the methane bottoms,

(d) withdrawing a liquid methane stream possessing the additional refrigeration from the bottoms of the low pressure distillation stage, and

(e) vaporizing the liquid methane stream against nitrogen overhead of the high pressure distillation stage to condense at least a portion of the nitrogen overhead to provide sufficient nitrogen reflux to the high pressure distillation stage for scrubbing substantially all of the carbon dioxide out of the feed stream in the high pressure distillation stage and keeping it soluble in the hydrocarbon bottoms, and methane reboil to the low pressure distillation stage.

5. A method for rejecting nitrogen from a natural gas stream containing variable amounts of methane, nitrogen, carbon dioxide and ethane-plus hydrocarbons which comprises

(a) passing the natural gas stream through a cooling zone,

(b) introducing the cooled natural gas stream into the high pressure distillation stage of a double distillation cycle comprising a high pressure distillation stage and a low pressure distillation stage,

(c) fractionally distilling the natural gas stream in the high pressure distillation stage at a pressure sufficient to provide an overhead consisting essentially of nitrogen substantially free of methane and carbon dioxide and a bottoms comprising substantially all of the carbon dioxide dissolved in the ethane-plus hydrocarbons,

(d) withdrawing a liquid side stream consisting essentially of nitrogen and methane substantially free of carbon dioxide from an intermediate level of the high pressure distillation stage, expanding the side stream through a valve and introducing it into an intermediate level of the low pressure distillation stage,

(e) condensing the nitrogen overhead from the high pressure distillation stage by heat exchange with a methane cycle to provide nitrogen reflux for the high pressure distillation stage and a nitrogen liquid stream, which methane cycle comprises

(i) removing a vapor methane stream from the bottoms of the low pressure distillation stage and warming it,

(ii) compressing the vapor methane stream and condensing at least a portion of the compressed methane stream against a waste nitrogen overhead stream from the low pressure distillation stage,

(iii) expanding the condensed methane stream through a valve and combining it with the methane bottoms of the low pressure distillation stage to provide additional refrigeration to the methane bottoms,

(iv) withdrawing a liquid methane stream possessing the additional refrigeration from the bottoms of the low pressure distillation stage, and

(v) vaporizing the liquid methane stream against the nitrogen overhead of the high pressure distillation stage to condense at least a portion of the overhead to provide sufficient nitrogen reflux to the high pressure distillation

stage for scrubbing the carbon dioxide out of the feed stream and methane reboil to the low pressure distillation stage,

(f) expanding the nitrogen liquid stream through a valve into the top of the low pressure distillation stage, and

(g) fractionally distilling the nitrogen and methane in the low pressure distillation stage to recover a waste nitrogen vapor overhead stream and a methane product bottoms stream.

4,451,276

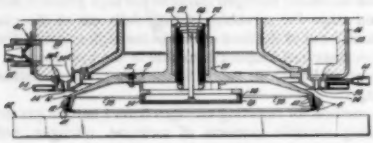
METHOD AND APPARATUS FOR GLASS FIBERIZATION

Marie-Pierre Barthe, 5 bis, rue Marcel Duchemin, Clermont 60600; Jean A. Battigelli, 17, rue Edouard Vaillant, and Francois Bouquet, 30, rue Edouard Vaillant, both of, Rantigny 60290, all of France

Filed Aug. 18, 1982, Ser. No. 409,336

Int. Cl.³ C03B *37/04*

U.S. Cl. 65—6 **6 Claims**



1. A method for centrifugally producing glass fibers from a glass composition as follows:

SiO_2	61 to 72%
Al_2O_3	2 to 8%
Fe_2O_3	0.2 to 1%
CaO	4.7 to 7.5%
MgO	0 to 5%
$Na_2O + K_2O$	14 to 18%
B_2O_3	0 to 6%
F	0 to 1.5%
BaO	0 to 2.5%
ZrO_2	0 to 2.5%
Misc	≦1%

said method comprising the steps of introducing the glass in molten attenuable condition into a spinner for delivery to the interior surface of the peripheral wall thereof, said peripheral wall having a multiplicity of orifices therein, rotating said spinner to effect the centrifugal delivery of the glass through the spinner orifices in a multiplicity of streams, and attenuating said glass streams into fibers by means of an internal combustion burner providing a generally downwardly directed annular gaseous blast adjacent the exterior of said peripheral wall, said gaseous blast having an elevated temperature contributing to the maintenance of the glass streams in attenuable condition for a time sufficient to effect attenuation thereof, and wherein centrifugal acceleration at the spinner wall, the peripheral velocity of the spinner and the burner pressure fall within the following ranges:

centrifugal acceleration	4000 to 20000 m/sec²
peripheral velocity	50 m/s to 130 m/s
burner pressure	100 mm to 900 mm (water column).

4,451,277

PRODUCTION OF FLUID FERTILIZER FROM PHOSPHORUS FURNACE WASTE STREAM

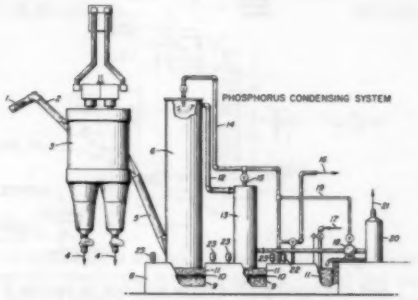
James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Continuation-in-part of Ser. No. 301,378, Sep. 11, 1981, Pat. No. 4,383,847, which is a division of Ser. No. 223,122, Jan. 7, 1981, Pat. No. 4,372,929. This application Sep. 30, 1982, Ser. No. 428,840

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ C05B *11/10, 7/00*

U.S. Cl. 71—36 **10 Claims**



1. A process for the production of fluid fertilizer comprising the steps of:

(a) smelting a mixture of phosphate ore, reducing carbon, and silica rock in a submerged arc electric furnace wherein a phosphorus-containing gas is evolved;

(b) treating phosphorus-containing gas in an electrostatic precipitator to remove suspended dust;

(c) cooling the phosphorus-containing gas in an adiabatic condenser wherein water is (i) sprayed into the condenser to contact the phosphorus containing gas to condense phosphorous from the gas, (ii) collected in a sump, and (iii) recirculated to the condenser;

(d) adding an alkaline material to the recirculating stream of water of step (c) to maintain the pH in the range of 5.5 to 6.0;

(e) adding fresh water to the recirculating stream;

(f) bleeding off a stream of water from the recirculating stream;

(g) clarifying the bleedoff water from step (f);

(h) adding the clarified bleedoff water from step (g) to an orthophosphate suspension fertilizer process comprised of two or three stages of ammoniation wherein clarified bleedoff water is added to the first-stage ammoniator to replace employment of fresh water.

4,451,278

1-HYDROXYANTHRAQUINONE AQUATIC HERBICIDE

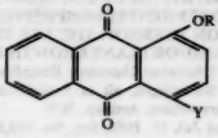
David I. Randall, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 121,520, Mar. 5, 1971, abandoned. This application Jul. 28, 1972, Ser. No. 276,151

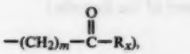
Int. Cl.³ A01N *35/04*

U.S. Cl. 71—66 **9 Claims**

1. A method of inhibiting the growth of the weeds which comprises: applying to the situs to be treated an effective, herbicidal amount of an anthraquinone having the formula



wherein Y is hydrogen or methyl, R is selected from the group consisting of hydrogen,



phenyl, and phenyl substituted with a radical of the group consisting of methyl, chloro, sulfamyl containing not more than 6 carbon atoms, sulfonyl chloride and methyl pyridinium chloride; and wherein m is 0 or 1 and R_x is $-N(R_y)_2$ or a radical containing not more than 3 carbon atoms selected from the group consisting of alkyl, dichloroacrylate, chloroalkyl, chloroalkoxy, and alkoxy and wherein R_y is selected from the group consisting of hydrogen, methyl, ethyl, phenyl and, when taken together with the nitrogen, forms a pyridinyl ring.

2. A method of inhibiting the growth of aquatic weeds, according to claim 1 by applying thereto an effective amount of 1-hydroxyanthraquinone.

4,451,279

SULFUR-CONTAINING OXIME COMPOUNDS, PROCESSES FOR PRODUCING THEM, AND THEIR USE FOR PROTECTING CULTIVATED PLANTS

Elmar Sturm, Aesch; Heinrich Schempp, Arlesheim, and Henry Martin, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

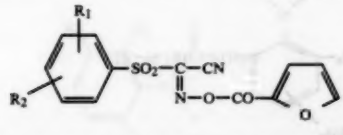
Division of Ser. No. 068,123, Aug. 20, 1979, Pat. No. 4,278,613. This application May 4, 1981, Ser. No. 260,536

Claims priority, application Switzerland, Aug. 28, 1978, 9081/78

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—93 **53 Claims**

1. A herbicidal composition for controlling weeds in cereal crops comprising a herbicidally effective amount of a herbicide selected from the group consisting of herbicidal 1,3,5-triazines, halogenoacetanilides, substituted phenoxyphenoxyacetic acid esters and -propionic acid esters, and substituted pyridineoxy-phenoxy-acetic acid esters and -propionic acid esters derivatives, and a quantity of a compound of the formula:



wherein each of R_1 and R_2, independently of the other, is hydrogen, halo or alkyl of 1 to 4 carbon atoms, sufficient to afford protection to treated crops against the effects of said herbicide.

4,451,280

DITHIANE AND DITHIOLANE HERBICIDE ANTIDOTES

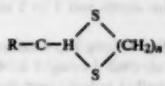
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 5, 1982, Ser. No. 365,932

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—90 **12 Claims**

1. The method of protecting a cereal grain crop from injury due to S-propyl N,N-dipropyl thiolcarbamate herbicide, comprising preplant incorporation in the soil in which said crop is to be planted, a non-phytotoxic antidotally effective amount of a compound corresponding to the formula



wherein R is dichloromethyl and n is 2 or 3.

4,451,281

FUNGICIDAL AND PLANT GROWTH-REGULATING 1-AZOLYL-2-OXIMINOBUTANE AND USE

Hans-Ludwig Elbe; Wolfgang Krämer, both of Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch-Gladbach; Paul Reinecke, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

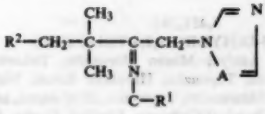
Filed May 2, 1983, Ser. No. 490,688

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3219041

Int. Cl.³ A01N *43/50, 43/64*; C07D *233/61, 249/08*

U.S. Cl. 71—92 **10 Claims**

1. A 1-azolyl-2-oximinobutane derivative of the formula



in which

A is nitrogen or CH,

R^1 is hydrogen, alkyl, halogenoalkyl, alkenyl, alkinyl, or optionally substituted benzyl, phenyl, cycloalkyl, cycloalkylalkyl or cycloalkenyl, and

R^2 is optionally substituted phenyl, phenoxy, phenylthio, phenylsulphinyl or phenylsulphonyl,

or a physiologically acceptable addition product thereof with an acid or metal salt.

8. A fungicidal or plant growth regulating composition comprising an effective amount of a compound or addition product according to claim 1 in admixture with a diluent.

4,451,282

HERBICIDALLY ACTIVE NOVEL HETERO-SUBSTITUTED PYRID-4-ONE DERIVATIVES

Hans-Joachim Knops; Peter Babczinski, both of Wuppertal; Ludwig Eue, Leverkusen, and Robert Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

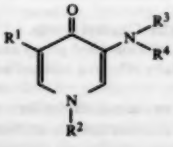
Filed Aug. 26, 1982, Ser. No. 411,749

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135186

Int. Cl.³ A01N *43/40*; C07D *401/02*

U.S. Cl. 71—92 **9 Claims**

1. A hetero-substituted pyrid-4-one derivative of the formula



in which

R^1 represents a phenyl radical which is optionally monosubstituted or polysubstituted by identical or different substituents selected from halogen, alkyl, alkoxy or alkylthio, each having 1 to 4 carbon atoms, and halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms,

R^2 represents an alkyl having 1 to 4 carbon atoms, an alkenyl or alkinyl radical, each having 3 to 4 carbon atoms, an alkoxy or alkoxyalkyl radical, each having 1 to 4 carbon atoms in each alkyl part, or a dialkylamino radical having 1 to 4 carbon atoms in each alkyl part, and

R^3 and R^4, together with the nitrogen atom to which they are bonded, represent a heterocyclic radical which is optionally substituted by methyl, methoxy or chlorine and is selected from 1,2,4-triazolyl, imidazolyl and pyrazolyl.

4,451,283

5-OXO-2,5-DIHYDRO-1,2,4-TRIAZINES

Yuzuru Sanemitsu, Ashiya; Masao Shiroshita, Takarazuka; Shunichi Hashimoto, Toyonaka; Haruhiko Katoh, Nishinomiya, and Hiroshi Matsumoto, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

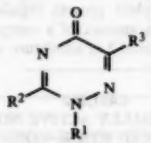
Filed Jul. 9, 1981, Ser. No. 281,776

Claims priority, application Japan, Jul. 16, 1980, 55-98088; Jul. 18, 1980, 55-98957; Jul. 21, 1980, 55-100334

Int. Cl.³ C07D *253/06;* **A01N** *43/64*

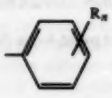
U.S. Cl. 71—93 **15 Claims**

1. A herbicidal composition suitable for agricultural use which comprises at least one triazine compound of the formula:



(I)

wherein R^1 is a C_1–C_6 alkyl group or an amino group, R^2 is a C_1–C_4 alkoxy group, a C_1–C_4 alkylthio group or a di(C_1–C_4) alkylamino group and R^3 is a cyclo(C_3–C_7)alkyl group, a tertiary C_4–C_5 alkyl group, an adamantyl group or a group of the formula:



in which R is a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a nitro group or a trihalomethyl group and n is an integer of 0 to 2 in a herbicidally effective amount and an inert carrier or diluent.

4. The composition according to claim **1**, in the form of an emulsifiable concentrate wherein said inert carrier or diluent is a liquid carrier.

4,451,284

DERIVATIVES OF 2-NITRO-4- OR -5-PYRIDYLOXYPHENYLPHOSPHONIC ACID, THE PREPARATION THEREOF, THE USE THEREOF AS HERBICIDES AND/OR PLANT GROWTH REGULATORS

Ludwig Maier, Arlesheim; Hermann Rempfler, Ettingen, and Dieter Dürr, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

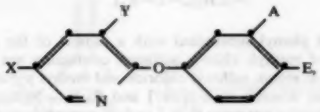
Filed Jul. 19, 1982, Ser. No. 399,504

Claims priority, application Switzerland, Jul. 28, 1981, 4891/81

Int. Cl.³ C07F *9/58;* **A01N** *43/40;* **A61K** *31/44*

U.S. Cl. 71—94 **52 Claims**

1. A compound of the formula I



(I)

wherein X is halogen or trifluoromethyl, Y is hydrogen or halogen, one of the two substituents A and E is a phosphonate group

wherein R is C_1–C_4alkyl or hydrogen and the other is a nitro group, or a metal salt "selected from amongst alkali, alkaline earth and transition metals" thereof or a salt thereof with ammonium or an organic nitrogen base.

4,451,285

HERBICIDAL 2-HALOACETANILIDES

Gerhard H. Alt, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

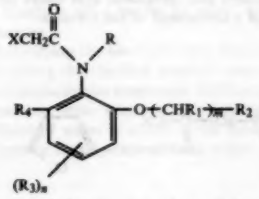
Continuation-in-part of Ser. No. 133,765, Mar. 25, 1980, Pat. No. 4,332,614. This application May 28, 1982, Ser. No. 383,039

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ A01N *37/34, 37/24;* **C07C** *103/34, 121/78*

U.S. Cl. 71—105 **33 Claims**

1. A compound of the formula



wherein

X is chloro, bromo or iodo;

R is H, C_{1-5} alkyl or alkoxymethyl, cyanomethyl, azolylmethyl, C_{3-5} alkenyl, alkynyl or alkenyloxymethyl;

R_1 and R_3 are H or C_{1-4} alkyl;

R_2 is C_{1-4} alkoxy, polyalkoxy, alkoxyalkyl or dialkoxymethyl, 2-furyl, 2-tetrahydrofuryl or 2-thienyl;

R_4 is H, C_{1-4} alkyl or halogen;

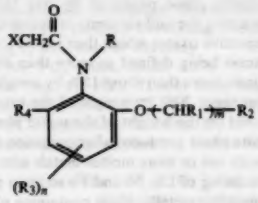
m is 1 or 2; and

n is 1–3;

provided that when R is alkoxymethyl, R_4 is hydrogen or halogen.

23. A method of controlling undesired plants which com-

prises contacting said plants or the plant growth medium with a herbicidal amount of a compound of the formula



wherein

X is chloro, bromo or iodo;

R is H, C_{1-5} alkyl or alkoxymethyl, cyanomethyl, azolylmethyl, C_{3-5} alkenyl, alkynyl or alkenyloxymethyl;

R_1 and R_3 are H or C_{1-4} alkyl;

R_2 is C_{1-4} alkoxy, polyalkoxy, alkoxyalkyl or dialkoxymethyl, 2-furyl, 2-tetrahydrofuryl or 2-thienyl;

R_4 is H, C_{1-4} alkyl or halogen;

m is 1 or 2 and

n is 1–3;

provided that when R is alkoxymethyl, R_4 is hydrogen or halogen.

4,451,286

COMPOSITIONS, WHICH INFLUENCE PLANT GROWTH AND PROTECT PLANTS BASED ON OXIME ETHERS AND OXIME ESTERS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

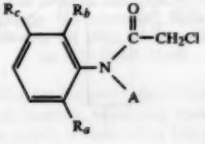
Continuation of Ser. No. 144,160, Apr. 28, 1980, abandoned, which is a division of Ser. No. 939,096, Sep. 1, 1978, abandoned, said Ser. No. 939,096, Continuation-in-part of Ser. No. 881,953. This application Oct. 5, 1981, Ser. No. 308,690

Claims priority, application Switzerland, Mar. 2, 1977, 02606/77; Feb. 7, 1978, 01348/78

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—107 **4 Claims**

1. A process for protecting cultivated plants selected from the group consisting of millet, rice, maize, wheat, rye, barley and oats against the action of a chloroacetanilide herbicide of the formula



in which

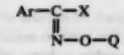
R_c is hydrogen and methyl,

one of R_a and R_b being hydrogen, methyl or ethyl, and the other of R_a and R_b being hydrogen, methyl, tert.butyl, methoxy or chlorine, when R_c is hydrogen,

one of R_a and R_b being methyl, and the other of R_a and R_b being hydrogen or methyl, when R_c is methyl; and

A is C_1–C_4-alkoxy-C_1–C_4-alkyl,

by applying to the plants, to parts or to generative parts of the plants or to the habitat thereof, in any desired sequence, namely before, simultaneously with, or after, the application of said herbicide, an antidotally effective amount of a compound of the formula



in which

Ar is phenyl, para-phenoxyphenyl or -naphthyl,

X is methoxycarbonyl or ethoxycarbonyl and

Q is methyl, ethyl or n-amyl.

4,451,287

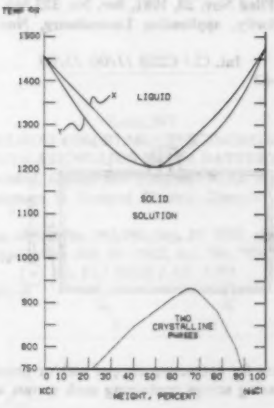
FLUX IN RECOVERY OF ALUMINUM IN REVERBERATORY FURNACE

Carl F. Bauer, Chicago; James H. Hussey, Hammond, and Benny Langston, Barrington, all of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 328,605, is a division of Ser. No. 192,946, Oct. 2, 1980, abandoned. This application Sep. 7, 1983, Ser. No. 529,672

Int. Cl.³ C22B *21/00*

U.S. Cl. 75—24 **6 Claims**



1. A process for the recovery of metal from dross in a charge well of a reverberatory furnace wherein said dross includes at least one inert material and wherein the improvement comprises supplying thermally formed flux in solid particle form to the charge well in a ratio of thermally formed flux to said inert material of less than about 0.4, said flux being an alloyed mixture consisting essentially of a double salt which is 40% to 60% sodium chloride and 60% to 40% potassium chloride, said alloyed mixture having been produced by mechanically mixing said sodium chloride and said potassium chloride, heating the mixture to produce a liquid to effect complete alloying and chemical mixing thereof, and cooling the mixture to solidify it.

4,451,288

METHOD FOR PRODUCING LOW HYDROGEN CONTENT IN STEELS PRODUCED BY SUBSURFACE PNEUMATIC REFINING

Rockne J. Andreini, Redmond, Wash., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1982, Ser. No. 393,467

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—60 **11 Claims**

7. A method for production of low hydrogen steel by subsurface pneumatic refining, comprising the steps of:

(a) drying a refining vessel to remove substantially all water;

(b) charging the refining vessel with a steel melt;

(c) adding all additions to the melt as early as possible to

allow the maximum time for sparging of hydrogen from the melt;

(d) decarburizing the melt of at least about 0.35% carbon by blowing oxygen on the melt to assist the hydrogen sparging by creating a suitable volume of off-gas, wherein the minimum oxygen blowrate is about 1200 SCF/hr-ton of steel;

(e) substantially preventing entry of moisture into contact with the melt during processing steps following decarburization by blowing the melt with a sparging gas to maintain the flow conditions at the vessel mouth to minimize air infiltration into the vessel; and

(f) minimizing the time spent for the processing steps following decarburization to reduce the time for hydrogen absorption into the melt.

4,451,289

PROCESS FOR EXTRACTING NON-FERROUS METALS FROM IRON-BEARING SCRAPS

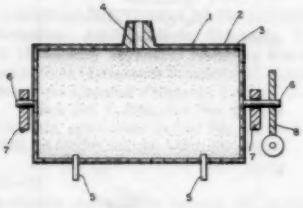
Michel C. Van Hecke, Aartselaar, and Luc M. Fontainas, Antwerp, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Belgium

Filed Nov. 20, 1981, Ser. No. 323,363

Claims priority, application Luxembourg, Nov. 28, 1981, 82970

Int. Cl.³ C22B *11/00, 15/00*

U.S. Cl. 75—63 **8 Claims**



1. A process for extracting copper and/or precious metals from iron-bearing scraps containing such metals which comprises

(a) adding the scraps and a slagging agent for iron to a molten copper bath,

(b) injecting an oxygen-containing gas into said bath, and

(c) maintaining the temperature of said bath below about 1400° C., whereby copper and/or precious metals are extracted from the scraps in the said bath, while slagging the iron of the scraps.

4,451,290

RECOVERY OF PLATINUM GROUP METALS FROM SCRAP AND RESIDUES

John Hill, Sandton, South Africa, and Joseph G. Day, Holmer Green, England, assignors to Matthey Rustenburg Refiners (Proprietary) Limited, Johannesburg, South Africa

Filed Sep. 15, 1982, Ser. No. 418,541

Claims priority, application United Kingdom, Sep. 16, 1981, 8127976

Int. Cl.³ C22B *11/00*

U.S. Cl. 75—63 **11 Claims**

1. A process for the recovery of platinum group metals, Ag and Au from a precious metal containing residue which includes the platinum group metals, Ag and Au together with Fe, Cu, Ni, Se and Te, said process comprising the following steps:

(a) smelting the said precious metal containing residue with leach residue including S and a flux to produce

(i) a slag and

(ii) a copper matte phase containing S, the platinum group metals, Au, Ag, Se and Te, and an excess of Ni and/or Fe as defined in step (b) below,

(b) removing excess of the elements Fe or Ni or compounds thereof from the matte phase produced by step (a) by oxidation thus converting the said elements or compounds thereof to their respective oxides which then report to the slag phase, said excess being defined as more than about 10% by weight of iron, more than about 15% by weight of nickel or more than about 20% by weight of the total of iron and nickel, based on the weight of the matte phase,

(c) contacting the matte phase produced after oxidation step (b) in liquid form with one or more molten metals selected from the group consisting of Cu, Ni and Fe so as to produce a separate immiscible metallic phase containing platinum group metals, silver and gold, and

(d) recovering silver from the matte phase and the platinum group metals, gold and the proportion of silver which remains from the metallic phase.

4,451,291

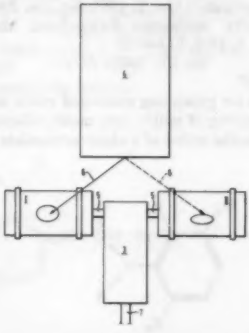
METHOD AND APPARATUS FOR CONVERTING MATTE, PARTICULARLY HIGH-GRADE MATTE

Matti O. Leiponen, Espoo, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Nov. 30, 1982, Ser. No. 445,480

Int. Cl.³ C22B *15/06*

U.S. Cl. 75—73 **19 Claims**



1. In combination, an apparatus for converting matte, into metal, slag and gas containing sulphur dioxide, and a gas processing equipment for processing gas containing sulphur dioxide generated during conversion of the matte, said apparatus comprising a pair of essentially equal sized converters disposed in spaced relationship with the gas processing equipment located therebetween, means for feeding oxygen-containing gas to the converters so that such gas can be blown through matte in each converter so as to produce a flow of gas containing sulphur dioxide from the converter, and means connecting the converters in common to the gas processing equipment so that the flows of gas containing sulphur dioxide from the two converters are fed to the gas processing equipment.

4,451,292

SINTERED HARDMETALS

Fred W. Hall, Metallurg Group Industrial Development Office, 64 Fargate, Sheffield, South Yorkshire, S1 2HE, England, and Hans-Joachim Retelsdorf, Gesellschaft für Elektrometallurgie m.b.H., Zentrale Forschung, Postfach 2844, 8500 Nürnberg 1, Fed. Rep. of Germany

PCT No. PCT GB81/00036, § 371
Date Sep. 17, 1981, §102(e) Date Sep. 17, 1981, PCT Pub. No. WO81/02588, PCT Pub. Date Sep. 17, 1984
This PCT application filed Sep. 17, 1981, Ser. No. 305,625
Claims priority, application United Kingdom, Mar. 4, 1980, 8007382
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.³ B22F 3/12; C22C 14/00, 1/04
U.S. Cl. 75—238 15 Claims

1. A sintered hardmetal which comprises tungsten carbide, a binder comprising one or more metals or alloys of the iron group and a mixed crystal material prepared by subjecting a mixture comprising zirconium and titanium carbides to heating at a temperature and for a time sufficient for the mixed crystal product to undergo spinodal decomposition upon cooling into a TiC-ZrC phase rich in TiC and a TiC-ZrC phase rich in ZrC, the amount of mixed crystal material present in the hardmetal being in the range from 2% to 40% by weight of the hardmetal.

4,451,293

SLAG-FORMING AGENT AND PROCESS FOR PRODUCING THE AGENT

Minoru Kitamura, Nishinomiya; Toshiyuki Soejima, Kobe; Tsutomu Hayashi; Hideo Matsui, both of Kakogawa, and Shigenori Fujisawa, Narashino, all of Japan, assignors to Quigley Company, Inc., New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 392,510
Claims priority, application Japan, May 31, 1979, 54-67665
Int. Cl.³ C22B 9/10
U.S. Cl. 75—257 12 Claims

1. An agent comprising an aggregate of particulate slag-forming material, said material having a maximum particle diameter of 3.0 millimeters and containing at least 15 weight percent magnesium oxide, said aggregate being coated with cement in the amount of from 5 to 20 percent by weight.

4,451,294

WATER RESISTANT AND HEAT INSULATING MATERIAL AND METHOD OF MAKING SAME

Marin A. Popov, and Todor G. Georgiev, both of Sofia, Bulgaria, assignors to Knipsm "Zavodproekt", Sofia, Bulgaria

Filed Aug. 30, 1982, Ser. No. 412,961
Int. Cl.³ C04B 21/00
U.S. Cl. 106—75 5 Claims

1. A composition for the production of waterproof and heat insulating silicate material, consisting essentially of SiO_2 of from 62 to 68%; Al_2O_3 of from 1.5 to 5%; B_2O_3 of from 5 to 10%; CaO+MgO of from 0.1 to 0.5% and Na_2O of from 21 to 26%, all percentages being by weight.

4,451,295

CEMENTS, MORTARS AND CONCRETES

James H. Sprouse, El Toro, Calif., assignor to Standard Concrete Materials, Inc., Santa Ana, Calif.

Filed Sep. 29, 1982, Ser. No. 426,679
Int. Cl.³ C04B 7/14
U.S. Cl. 106—89 10 Claims

1. A product comprising a blend of granulated blast furnace slag and at least one of ground calcium carbonate and cement kiln dust in which the proportion of slag to ground calcium carbonate and cement kiln dust is between nine to one and one to one by volume.

4,451,296

RUST REMOVAL PROCESS

Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 364,000, Mar. 31, 1982, Pat. No. 4,424,079. This application Dec. 29, 1982, Ser. No. 454,127
Int. Cl.³ B08B 7/00
U.S. Cl. 134—4 10 Claims

1. Process for removing rust from a rusty metal surface which comprises:

(a) applying to said rusty surface a layer of rust removal coating composition consisting essentially of an aqueous solution of a copolymer of maleic acid and monomer of the formula $CH_2{=}CHR$ wherein R represents H, CH_3, $OCOR^1$ and R^1 represents CH_3 or CH_2CH_3; and

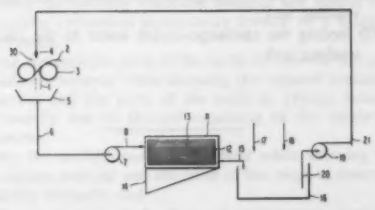
(b) allowing said layer of coating composition to dry whereby rust becomes incorporated into said layer and the layer containing the rust detaches itself from the surface.

4,451,297

METHOD FOR REMOVING INORGANIC PARTICULATE SOLIDS FROM BATTERY STRIP

K. D. Kaswinkel, Gainesville, Fla., and M. J. Wynn, Latham, N.Y., assignors to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 192,290, Sep. 30, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,570
Int. Cl.³ B08B 1/00, 7/04
U.S. Cl. 134—9 5 Claims



1. A process for removing essentially inorganic, particulate solids from at least one surface of battery strip carrying loosely adherent particles selected from the group consisting of nickel, nickel hydroxide, and cadmium hydroxide comprising:

brushing said surface in a cleaning zone under conditions whereby said loosely adherent particles are released from said surface, and simultaneously passing an aqueous solution consisting essentially of water and sodium hydroxide over said surface at said brushing zone, said sodium hydroxide being present in a concentration of at least about five percent, thereby lubricating said surface and carrying released particles from said surface as a suspension in said aqueous solution;

collecting the resulting suspension;

separating particles suspended in the aqueous solution of sodium hydroxide from the aqueous solution thereby producing a clarified sodium hydroxide solution; and

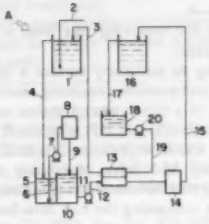
recycling at least a portion of the resulting clarified sodium hydroxide solution to said brushing zone.

4,451,298

METHOD AND SYSTEM FOR RECYCLING WASHING LIQUIDS AND THE HEAT CONTAINED THEREIN

Aisaburo Yagishita, Nagoya; Noboru Mori, Inuyama; Kinshiro Kusumi, Konan, and Yoshio Tsugi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Sanshin Seisakusho, Nagoya, Japan

Filed Dec. 8, 1981, Ser. No. 328,498
Int. Cl.³ B08B 7/04
U.S. Cl. 134—10 **7 Claims**



1. A method for recovering and recycling washing liquids and the heat contained therein, said liquids being used in chemical surface treatments requiring serial hot and cold water washes, in either order, said wash waters respectively overflowing from hot and cold water washing tanks as effluents which comprises the steps of

(a) collecting and segregating said effluents;

(b) filtering contaminents from the first of said serial effluent wash waters;

(c) permitting the cold effluent wash water to exchange heat with the hot effluent wash water;

(d) introducing the filtrate at a temperature below about 40° C. into an ion exchanger to yield purified filtrate;

(e) feeding the exchange-heated water to the hot water washing tank;

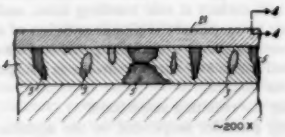
(f) feeding the exchange-cooled water to the cold water washing tank.

4,451,299

HIGH TEMPERATURE COATINGS BY SURFACE MELTING

John G. Smeggil, Simsbury; Norman S. Bornstein, West Hartford, and Clyde O. Brown, Newington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 22, 1982, Ser. No. 421,553
Int. Cl.³ C21D 7/00
U.S. Cl. 148—1 **4 Claims**



1. A method for improving the oxidation resistance of a coated superalloy article which comprises: preheating the article to a temperature above its brittle to ductile transformation temperature, using a concentrated source of heat energy to rapidly melt a portion of the coating so that upon the resultant rapid solidification, a refined super-saturated material, capable of forming a continuous protective oxide scale, results.

4,451,300

Patent Not Issued For This Number

4,451,301

ORGANIC PHOSPHATING SOLUTION FOR THE PHOSPHATING OF METALLIC SURFACES

Dieter J. Mueller, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,799
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209829
Int. Cl.³ C23F 7/10
U.S. Cl. 148—6.15 R **15 Claims**

1. A homogeneous phosphating solution comprising effective amounts of a low-boiling halogenated hydrocarbon; aqueous phosphoric acid; methanol or a C_{1-6} alkanol mixture predominantly comprising methanol; an optional stabilizer; an optional inhibitor; an optional accelerator; and 0.01–2.0% by weight of a formic acid ester of a C_{1-12}-alkanol as an activating crystal nucleator.

4,451,302

ALUMINUM NITRIDING BY LASER

Ernest Prescott, Arnold, and William C. Cochran, Fox Chapel Borough, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 27, 1982, Ser. No. 412,113
Int. Cl.³ C22F 1/04
U.S. Cl. 148—13.1 **11 Claims**

1. A method for nitriding a metal workpiece, comprising:

(a) providing a workpiece comprising compact aluminum or aluminum alloy containing less than about 2.1 weight percent magnesium;

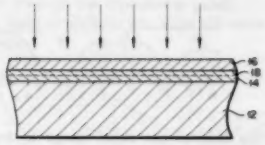
(b) maintaining an atmosphere rich in nitrogen in contact with said workpiece; and

(c) exposing a portion of the surface layer of said workpiece to a laser beam at a power density of at least 0.1×10^6 W/cm^2 for less than one second to form on said workpiece a hardened surface layer comprising aluminum nitride.

4,451,303
DIFFUSION OF ALUMINUM

Shunichi Hiraki, Hiratsuka; Kiyoshi Kikuchi, Yokohama; Shigeo Yawata, Kawasaki, and Masafumi Miyagawa, Kitakyushu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 5, 1983, Ser. No. 455,795
Claims priority, application Japan, Jan. 18, 1982, 57-5026
Int. Cl.³ H01L *21/225, 21/265*
U.S. Cl. 148—187 6 Claims



1. A method for producing a semiconductor element comprising the steps of:

forming a porous alumina layer on a semiconductor substrate;

forming a diffusion-protective layer formed of a material having a large oxygen-diffusion-inhibiting ability on said porous alumina layer;

implanting aluminum ions into said porous alumina layer through said diffusion-protective layer to form an aluminum ion-implanted region in said porous alumina layer; and

heating the structure thus formed to diffuse the aluminum in said aluminum ion-implanted region into said semiconductor substrate, thereby forming a P-type impurity region in said semiconductor substrate.

4,451,304
METHOD OF IMPROVING THE CORROSION RESISTANCE OF CHEMICAL CONVERSION COATED ALUMINUM

Walter Batiuk, 8247 Ashworth N., Seattle, Wash. 98105

Continuation of Ser. No. 260,370, May 4, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 477,420
Int. Cl.³ C23C *1/08;* C23F *7/00*
U.S. Cl. 148—6.27 11 Claims

1. A method for treating aluminum to enhance corrosion resistance of its surface, which comprises:

a. deoxidizing the aluminum surface with a non-chromated deoxidizer;

b. exposing the aluminum surface to a solution containing the nitrite ion and having a pH below 5;

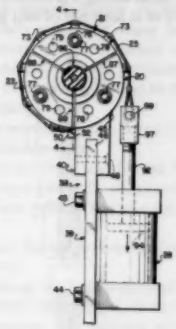
c. coating the aluminum surface with a chemical conversion solution; and

d. drying the chemical conversion coated aluminum surface with drying means.

4,451,305
APPARATUS AND METHOD FOR PRODUCING AN INSULATED CONNECTION BETWEEN ELECTRICAL CABLES

David H. Neuroth, Bethany, and Robert F. Smith, Jr., Oxford, both of Conn., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Aug. 2, 1982, Ser. No. 404,512
Int. Cl.³ H02G *1/14*
U.S. Cl. 156—49 15 Claims



13. A method of splicing a pair of electrical cables, each comprising a conductor surrounded by a cylindrical layer of insulation, comprising the steps of

removing the insulation adjacent the end of each electrical cable,

joining the ends of the conductors on the pair of electrical cables,

interposing uncured insulation material between the areas of removed insulation and around the joined conductors,

wrapping the uncured insulation material in a thin sheath of material,

enclosing the uncured insulation material and sheath in a generally cylindrical mold cavity formed by a multiple part mold,

heating the multiple parts of the mold to cure the uncured insulation material while allowing the uncured insulation material and the parts of the mold to expand radially outwardly due to thermal expansion of the insulation material,

cooling the multiple parts of the mold while allowing the insulation material and the parts of the mold to contract radially inwardly, and

simultaneously with the heating and cooling steps, applying a radially inwardly directed, equal and substantially constant force to each of the parts of the mold.

4,451,306
MANUFACTURE OF COEXTRUDED ORIENTED PRODUCTS

Stefan Verne, London, England, assignor to BICC Public Limited Company, London, England

Continuation-in-part of Ser. No. 58,304, Jul. 17, 1979, abandoned. This application Mar. 25, 1982, Ser. No. 361,778
Claims priority, application United Kingdom, Aug. 2, 1978, 32053/78
Int. Cl.³ H01B *13/14*
U.S. Cl. 156—51 4 Claims

1. A method of making a product comprising a core enclosed by two radially successive concentric extruded layers, at least one of which is of crystallisable polymeric material in which

(a) a core is enclosed by two concentric extruded layers, at least one of which is of crystallisable polymeric material,

by extruding the said layers in succession around but spaced from the core;

(b) the first and second layers are brought into thermal and mechanical engagement with each other before the first contacts the core;

(c) the relative thermal capacities of the parts and the temperatures of the layers as they are brought into enagagement are such that as the second layer cools and increases in strength and the first layer is heated by thermal transfer from the second layer and decreases in strength, a region of least overall yield strength is formed at a position where the temperature of at least one of said parts (being made of

a crystallisable polymeric material) is at a temperature between its glass transition temperature and its crystalline melting point; and

(d) a braking force is applied to the first layer by a gripping device engaging it after it has cooled below its glass transition temperature and before the second layer is extruded around it and an advancing force is applied to the inner and outer layers at a place beyond the region of least overall yield strength to stretch both layers longitudinally by at least 50% in the said region of least overall yield strength and so orient at least one of them and at the same time contract them until the inner layer engages the core.

2. A method as claimed in claim 1 in which the core is a wire.

4,451,307

METHOD OF APPLYING COLOR RELIEF DECORATIONS TO CERAMIC AND LIKE PRODUCTS

Kurt Zimmer, Losheim-Britten, Fed. Rep. of Germany, assignor to Villeroy & Boch Keramische Werke KG, Mettlach, Fed. Rep. of Germany

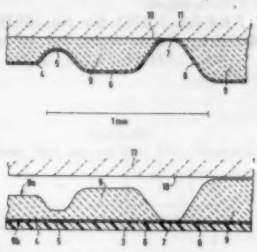
Continuation of Ser. No. 279,582, Jul. 1, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,658

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025364

Int. Cl.³ C03B *29/00*; B29C *17/00*; C04B *33/34, 35/64*

U.S. Cl. 156—63 **9 Claims**

1. A method of laminating onto a surface of a china, earthenware, stoneware or like ceramic object a composite image which is carried by an elastic lacquer layer on a decalcomania having a sheet-like carrier and a film of soluble material between the carrier and the elastic lacquer layer, said composite image including a relief image which consists of a material adapted to be bonded to the object by sintering and having a flat side, an uneven side and a color image which consists of at least one color field on the relief image, said color image being located between the elastic layer and the flat side of the relief image, said method comprising the steps of separating the elastic layer carrying the color and relief images from the carrier by dissolving the film; applying the uneven side of the relief image to the surface of the object; partially reversing the relief image by the application of pressure against the surface; and thereupon fully reversing the relief image by applying heat to sinter the material of the relief image and cause the previ-



ously uneven side of the relief image to become flat and contact the surface of the object and thereby cause the previously flat side of the relief image which is coated with the color field to present the relief image.

4,451,308

METHOD AND DEVICE FOR MAKING SEALS IN TUBULAR WEB PROVIDED WITH SIDE GUSSETS

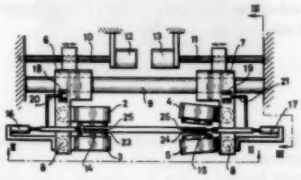
Arnoldus W. J. LeLoux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Em Zwolle, Netherlands

Filed Apr. 13, 1983, Ser. No. 484,507

Claims priority, application Netherlands, Apr. 20, 1982, 8201641

Int. Cl.³ B30B *5/02*

U.S. Cl. 156—64 **4 Claims**



1. A method of making seals in tubular web provided with side gussets, the location of the inner gusser edges being observed laterally in order to thereby determine the position of the sealing devices for making the gusset seals, wherein, after making the seals, the sensors for the inner gusset edges are withdrawn outwardly over a certain distance, the position of the sealing devices remaining unchanged, wherein, after transport of the tubular web, the sensors are moved inwardly again and the new position of the inner gusset edges is observed, and subsequently, when a difference is observed as compared with the previous time, the position of the sealing devices is brought into correspondence with this observation before making the next seal.

4,451,309

APPARATUS AND PROCESS FOR ALIGNING A PLATE AND MOUNTING IT ON A PRINT CYLINDER

Jack D. Cauldwell, Carroll, Ohio, assignor to Purity Packaging Corporation, Columbus, Ohio

Filed Feb. 28, 1983, Ser. No. 470,588

Int. Cl.³ B41F *5/00*

U.S. Cl. 156—64 **11 Claims**

8. A process for mounting a flexible printing plate on a print cylinder comprising,

providing a porous transparent panel having aligning indicia thereon,

supporting the panel on a pair of coaxially aligned pins, and with the axis being substantially horizontal,

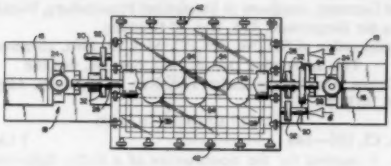
pivoting the panel on the pins to a substantially horizontal position,

placing a flexible printing plate face down on the upper side of the panel,

drawing a vacuum on the under side of the panel to thereby hold the plate in place on the panel,

pivoting the panel about said axis to an orientation such that the operator may view the indicia and the printing surface of the plate through the transparent panel,

adjusting the plate as necessary to align the same according to said indicia,



pivoting the panel to horizontal position with the printing side of the plate facing downward,

applying an adhesive to a print cylinder,

mounting the cylinder with its axis parallel with the upper surface of the porous panel and such that it is aligned with the plate, said cylinder axis lying in a plane perpendicular to said porous panel,

moving the cylinder and panel toward each other with the cylinder axis remaining in the plane and while maintaining the parallel relationship until the cylinder contacts and adheres to said plate,

releasing the vacuum,

drawing the free portion of the flexible plate around the cylinder.

4,451,310

PREPARATION OF LIGHTWEIGHT, INSULATING AND SEMIRIGID OR RIGID ELEMENTS

Jean-Claude Lairloup, Brionne, France, assignor to Nobel-Bozel, Puteaux, France

Filed Apr. 9, 1982, Ser. No. 367,131

Claims priority, application France, Apr. 14, 1981, 81 07466

Int. Cl.³ B32B *5/18*

U.S. Cl. 156—78 **13 Claims**

1. A process for preparing lightweight, insulating and semi-rigid or rigid elements, of the type including panels or parts of variable shapes or thicknesses comprising

impregnating a supple porous material having an inner structure with open cells, with a desired quantity of an isocyanate compound having at least one —NCO group,

then contacting said isocyanate impregnated supple porous material with water, whereby said water and said isocyanate begin to react, the reaction giving a derivative of urea or biuret,

then accelerating the reaction of said isocyanate compound with water by heating, and shaping under pressure the impregnated porous material to provide its final shape.

4,451,311

METHOD FOR MANUFACTURING A DAMPENING ROLL COVER

Tadashi Miyazaki, Showa, and Takao Hasegawa, Kuki, both of Japan, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,265

Claims priority, application Japan, Mar. 27, 1981, 56-46080

Int. Cl.³ B29C *27/20*

U.S. Cl. 156—86 **12 Claims**

1. A method for manufacturing a dampening roll cover which shrinks radially when hot water is applied to it, said dampening roll cover being comprised of hygro-thermally shrinkable fibers which have been preliminarily shrunken, but which are capable of shrinking further to the extent of at least about 10%, comprising:

a. forming a non-woven fibrous fleece comprised of hygro-thermally shrinkable fibers;

b. forming a cylinder from said fibrous fleece;

c. treating the hygro-thermally shrinkable fibers comprising said fibrous fleece with an aqueous solution of a crosslinkable binder;

d. solidifying said binder at temperatures which will not shrink the fibers;

e. partially shrinking the hygro-thermally shrinkable fibers of said cylinder by about 3% to about 50% by exposure to moisture to compact said cylinder of fibrous fleece; and

f. subjecting the compact cylinder to dry heat sufficient to crosslink said binder.

4,451,312

METHOD OF FORMING A LAMINATED FIRE SCREENING PANEL

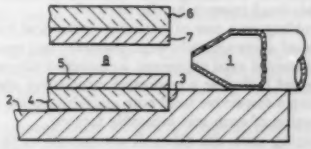
Hans-Henning Nolte, Gelsenkirchen, Fed. Rep. of Germany, assignor to BFG Glassgroup, Paris, France

Filed Mar. 25, 1980, Ser. No. 133,951

Claims priority, application United Kingdom, Apr. 5, 1979, 79/12061

Int. Cl.³ B32B *17/00*

U.S. Cl. 156—99 **13 Claims**

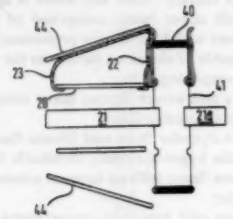


1. A method of forming a laminated light transmitting fire screening panel comprising at least one inter-layer of intumescent material sandwiched between two plies of glazing material, which comprises the steps of assembling the inter-layer and any ply of glazing material which is to be brought into face-to-face contact therewith while there is present therebetween an atmosphere which immediately prior to such contact consists at least in part of one or more materials which is more soluble in the intumescent material than is air, and subjecting the sandwich assembly to heat and/or pressure to bond it together to form the laminate.

4,451,313
PNEUMATIC TIRES

William L. Jackson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Continuation of Ser. No. 914,722, Jun. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,582, Jan. 11, 1978, abandoned. This application Apr. 7, 1982, Ser. No. 366,169
Claims priority, application United Kingdom, Jan. 11, 1977, 1019/77
Int. Cl.³ B29H *17/10, 17/12;* B60C *9/02, 9/18*
U.S. Cl. 156—132 12 Claims



1. A method of making a pneumatic tire comprising the steps of:

assembling on each of a pair of inflatable cylindrical formers which are in substantial axial alignment a respective tire sidewall component including a respective reinforcing ply having inner and outer ends;

arranging each tire sidewall component so that an axially outer free end portion of said reinforcing ply is uncovered on the associated former and an axially inner opposite end portion of said reinforcing ply terminates at a respective tire bead;

folding said opposite end portion of said reinforcing ply around said tire bead;

assembling a tire breaker structure on a collapsible cylindrical former positionable between said pair of inflatable formers; and

inflating said inflatable formers to bring said uncovered axially outer free end portions of said reinforcing plies of the associated tire sidewall component adjacent to and radially overlapping a respective axial edge of said breaker structure but terminating short of the other tire bead.

7. A method of making a pneumatic tire having a tread reinforced by a breaker, said breaker being connected at each axial edge to a respective sidewall, each sidewall terminating at its radially inner edge in a respective bead and a respective reinforcing ply originating from each bead and extending to and radially overlapping the breaker but terminating short of the other bead comprising the steps of:

assembling on a pair of inflatable cylindrical formers which are of approximately bead diameter and spaced apart in substantial axial alignment, a respective tire sidewall component including a respective reinforcing ply

placing a respective bead core assembly on the axially inner portion of each said inflatable former;

arranging each tire sidewall component so that an axially outer free end portion of said reinforcing ply is uncovered on the associated former and an axially inner opposite end portion of said reinforcement structure terminates at the associated bead core assembly;

folding said opposite end portion of said reinforcing ply around said tire bead core;

assembling a tire breaker structure on a collapsible cylindrical former of larger diameter than and positionable between said pair of inflatable formers;

moving said pair of inflatable formers axially inwardly toward said collapsible cylindrical former;

inflating said pair of inflatable formers so as to stretch the associated tire sidewall component axially and radially outwardly from the associated bead core assembly to which it is secured so as to bring said uncovered axially outer end portion of said reinforcing ply of the associated tire sidewall component adjacent to and radially overlapping a respective axial edge of said breaker structure; and

placing tread rubber over the radial outer surface of the then assembled tire carcass.

4,451,314
METHOD FOR THE MANUFACTURE OF A FLUFFY, LIGHT-WEIGHT, SOFT NONWOVEN FABRIC

Jürgen Knoke, Weinheim; Manfred Jöst, Hemsbach; Bohuslav Tecl, and Erich Fahrbach, both of Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Continuation of Ser. No. 268,177, May 29, 1981, abandoned.
This application Dec. 3, 1982, Ser. No. 446,688
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032398
Int. Cl.³ B32B *31/16, 5/06*
U.S. Cl. 156—148 7 Claims

1. A method for the manufacture of a fluffy, light-weight soft non-woven fabric, comprising the steps of:

(a) preparing a web of staple or endless fibers or mixtures thereof, at least some of which fibers are thermoplastically softenable;

(b) forming said web into a non-woven fabric by spot fusing the thermoplastically softenable fibers by heating portions of said fabric to completely fuse said thermoplastically softenable fibers, thereby causing the fibers of said web to become sufficiently bound together in the form of a non-woven fabric; and

(c) subjecting said non-woven fabric on one or both sides to needle-punching with barbed needles to produce about 20 to 100 punctures per square centimeter of said fabric, the penetration of the barbs of said needles being sufficient to produce a fluffy surface on the side of the fabric through which said needles emerge.

4,451,315
PROCESS FOR PRODUCING A NON-WOVEN FABRIC

Tadashi Miyazaki, Ibaragi, Japan, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Oct. 15, 1982, Ser. No. 434,475
Claims priority, application Japan, Nov. 20, 1981, 56-187495
Int. Cl.³ B31F *23/10*
U.S. Cl. 156—220 18 Claims

1. A process for preparing a pliable and durable non-woven fabric comprising:

a. printing a crosslinkable bonding agent in a patterned fashion onto one surface of a non-woven fiber assembly,

b. applying heat and pressure to the fiber assembly sufficient to cause the bonding agent on the surface of the fiber assembly to penetrate through the fiber assembly to the surface of the fiber assembly opposite to the surface to which the bonding agent was originally applied thereby densifying portions of the fiber assembly, said heat and pressure being insufficient to crosslink the bonding agent, and

c. applying heat to the fiber assembly sufficient to crosslink the bonding agent and to provide a pliable non-woven fabric having a distinct unevenness between the bonded and unbonded parts, wherein the areas of fiber assembly to which bonding agent has not been applied have a thickness about equal to the original thickness of the fiber assembly.

4,451,316

PROCESS FOR PREPARATION OF METAL VESSELS

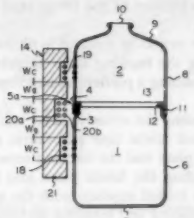
Kazuhisa Ishibashi, Tokyo; Hideo Kurashima, Yokosuka; Hisakazu Yasumuro; Michio Watanabe, both of Yokohama; Tsuneo Imatani, Yokosuka; Kazuo Taira, Tokyo; Seishichi Kobayashi, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,887

Claims priority, application Japan, Oct. 26, 1981, 56-170201; Jun. 22, 1982, 57-106220

Int. Cl.³ B29C *19/04*

U.S. Cl. 156—274.6 5 Claims



1. A process for the preparation of metal vessels, which comprises lap-bonding both the circumferential end portions of upper and lower members, each consisting of a seamless formed metal cup, through a layer of a hot adhesive interposed therebetween, wherein a high frequency induction heating coil is arranged so that the coil covers a part, smaller than the semicircle, of the circumferential portion to be formed into a seam, said seam consists of said end portions engaged with each other through the hot adhesive layer, applying electricity to the heating coil to induce an eddy current passing in the same or opposite direction from each of the side walls of the upper and lower members through said end portions and the circumferential portion, and the heating coil are rotated relative to each other, whereby the end portions of both the upper and lower members are preferentially heated and a seam is formed by heat bonding.

4,451,317

CONTINUOUS PROCESS FOR PRODUCING REINFORCED RESIN LAMINATES

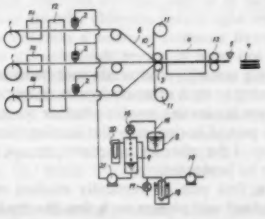
Masayuki Oizumi; Masakazu Uekita, both of Kobe; Masana Goto, Miki; Ichiro Azumi, Ohtsu; Shoji Uozumi; Masaharu Abe, both of Kobe; Yasuo Fushiki, Takatsuki; Minoru Isshiki, Kobe, and Kunio Kawasaki, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 223,402, Jan. 8, 1981, Pat. No. 4,372,800. This application Jun. 2, 1982, Ser. No. 384,438

Claims priority, application Japan, Jan. 8, 1980, 55-1020

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 4 Claims



1. In a continuous process for producing metal clad reinforced resin laminates comprising the steps of impregnating a fibrous cellulosic substrate with a liquid thermosetting unsaturated polyester resin which is free of volatile solvent and is capable of curing without generating liquid and gaseous by-products to a final resin content in the resin-impregnated substrate from 10 to 90% by weight based upon the total weight of said resin-impregnated substrate, laminating a plurality of the resin-impregnated substrates into a unitary member, sandwiching the laminate between a pair of covering sheets, at least one of said pair of covering sheets being a cladding metal foil capable of permanently bonding to said resin-impregnated substrates after the laminate is cured, and curing the laminate while supporting the same between said pair of covering sheets without applying any appreciable pressure, the improvement comprising:

preimpregnating the fibrous cellulosic substrate, prior to impregnation with said liquid resin, with a liquid containing a component selected from the group consisting of (i) a modified aminotriazinemethylol compound having an unsaturated bond capable of copolymerizing with a polymerizable monomer and (ii) an N-methylol compound free of said unsaturated bond and a polyfunctional compound having both a functional group capable of a condensation or addition reaction with the N-methylol compound and an unsaturated bond capable of copolymerizing with a polymerizable monomer.

4,451,318

SYSTEM FOR PREFABRICATING POCKET WELTS AND FACING STRIPS

Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Filed Sep. 21, 1981, Ser. No. 304,095

Int. Cl.³ B26D *5/00*; B32B *31/00, 31/04*; A41D *11/00*

U.S. Cl. 156—353 19 Claims

9. Apparatus for securing fabric segments for forming pocket welts to a strip of fusible adhesive-backed tape comprising:

a supply reel having a length of fusible adhesive-backed tape thereon;

a take-up reel for receiving tape from the supply reel;

guide means extending between the supply reel and the take-up reel for guiding the tape therebetween with the adhesive layer of the tape facing downwardly;

drive means for actuating the take-up reel to continuously exert a force on the tape tending to move the tape along the guide means from the supply reel toward the take-up reel;

clamping means located at a first point along the guide means situated relatively adjacent to the supply reel for normally preventing movement of the tape under the action of the drive means;

fabric attachment means located at a second point along the guide means downstream from the first point and comprising:

(a) a locator block adjacent the tape for positioning a fabric segment in a predetermined orientation below the path of the tape in the guide means;

(b) an anvil normally positioned below a fabric segment situated adjacent said locator block;

(c) means for raising the anvil and thereby lifting the fabric segment upward into engagement with the fusible adhesive layer of the tape in the guide means;

(d) fusible adhesive actuator means normally positioned above the tape in the guide means; and

(e) means for engaging the fusible adhesive actuating

means with the tape at a point opposite the location of the raised anvil to clamp the tape and the fabric segment between the anvil and the fusible adhesive actuator means thereby actuating the fusible adhesive of the tape to bond the fabric segment to the tape;

tape advancing means positioned at a third point along the guide means downstream from the second point and comprising:

(a) opposed jaws positioned on opposite sides of the tape in the guide means;

(b) means for actuating the jaws to clamp the tape therebetween;

(c) means for moving the jaws and the tape clamp therebetween along the path of the tape in the guide means from the third point to a fourth point along the guide means downstream from the third point, the distance between the third and fourth points being indexed to provide a uniform separation between the fabric segments on the tape;

means for releasing the clamping means when the tape advancing means is actuated to move the tape and the fabric segments attached thereto toward the take-up reel;

trimming means located at a fifth point along the path of the tape in the guide means downstream from the fourth point for cutting fabric segments secured to the tape to a predetermined size, the distance between the fifth and fourth points being an integer multiple of the distance between the third and fourth points so that as the tape is moved to receive a fabric segment at the fabric attachment means, a fabric segment is moved into the trimming means;

adhesive depositing means located at a sixth point along the path of the tape in the guide means downstream from the fifth point for depositing adhesive onto the upper surface of trimmed fabric segments secured to the tape, the distance between the sixth and fifth points being an integer multiple of the distance between the third and fourth points so that as the tape is moved to receive a fabric segment at the fabric attachment means, a fabric segment is moved into the adhesive depositing means; and

folding means located at a seventh point along the path of the tape in the guide means downstream from the sixth point for folding a portion of each trimmed fabric segment into engagement with the adhesive previously deposited on the upper surface of the fabric segment to form a pocket welt, the distance between the seventh and sixth points being an integer multiple of the distance between the third and fourth points so that as the tape is moved to receive a fabric segment at the fabric attachment means, a fabric segment is moved into the folding means.

4,451,319

SYSTEM FOR PREFABRICATING POCKET WELTS AND FACING STRIPS

Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Continuation-in-part of Ser. No. 304,095, Sep. 21, 1981. This application Jan. 28, 1982, Ser. No. 343,573

Int. Cl.[3] **B26D** *5/00;* **B32B** *31/00;* **B65H** *25/00;* **A41D** *27/20*

U.S. Cl. 156—353 **17 Claims**

10. An apparatus for prefabricating a string of pocket welts, comprising:

structure for translating a fabric tape along a fabric tape feedpath from an input position to an output position;

a station for placement of a fabric piece for forming a pocket welt proximate the fabric tape along the fabric tape feedpath;

first and second position sensors mounted on said station at a predetermined separation in the direction of the fabric tape feedpath for detecting the presence of a fabric piece, said sensors being positioned at a separation generally equal to the length of the fabric piece along the feedpath so that both sensors detect the fabric piece when the fabric piece is properly positioned at said station to permit accurate placement of a plurality of fabric pieces along the fabric tape;

means for bonding the fabric piece to the fabric tape for transporting the fabric piece with the fabric tape;

a rotatable supply reel containing a length of adhesive tape having an adhesive layer and a backing layer;

an adhesive layer cutting assembly having a cutting wheel for cutting a gap in the adhesive layer of the adhesive tape across the width thereof;

a positioning plate;

a backing separator for separating the backing layer and adhesive layer, said positioning plate and backing separator providing a path for the adhesive tape parallel to and proximate a portion of the fabric tape feedback;

a drive roller;

a pinch roller urged in contact with said drive roller for compressing the backing layer therebetween, said drive roller maintaining a predetermined tension on the backing layer;

means for bonding the adhesive layer of the adhesive tape to the combined fabric tape and fabric piece between said positioning plate and the backing separator;

means for folding the fabric piece and bonding the fabric piece in the folded position with the adhesive layer, said means for folding and bonding including a folding finger extending along the fabric tape feedpath about which the fabric piece is folded;

first and second positioning assemblies provided on either side of the folding finger for centering the fabric tape and fabric piece along a direction transverse to the feedpath for folding and bonding, each of said finger assemblies including:

front and rear fingers, each finger having at least one positioning surface for contacting the fabric tape, said positioning surface extending generally parallel the feedpath;

a base;

front finger plate means for mounting said front finger and slidably mounted on the base for motion transverse the fabric tape feedpath;

rear finger plate means for mounting said rear finger and slidably mounted on the base for motion transverse the fabric tape feedpath;

front and rear actuator means for selectively moving said front and rear finger plate means, respectively, transverse the direction of the fabric tape feedpath;

limit stop means for limiting the motion of said front and rear finger plate means, respectively, to position said fingers with the surfaces thereon centering the fabric tape for folding and bonding.

4,451,320

PACKET-TYPE LAMINATOR

Fred D. Marvel, 1417 E. 2nd St., Tulsa, Okla. 74120

Filed Jan. 11, 1982, Ser. No. 338,427

Int. Cl.[3] **B30B** *15/34*

U.S. Cl. 156—366 **6 Claims**

1. A packet-type laminating machine comprising:

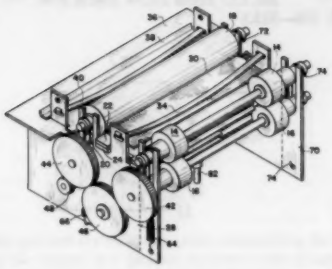
(a) a pair of vertical sidewall members adapted to rest on a lower edge during assembly wherein each of said vertical sidewall members contains a plurality of recesses along the top edge to accept the following items from above during assembly and retain said items in the stated relationship to each other during the operation and said packet-type laminating machine further comprising said items:

(i) a pair of horizontally flat heating platens lying one on top of the other and adapted to accept and heat a packet to be laminated,

(ii) a first pair of vertically stacked rollers positioned behind said platens such that the nip between said rollers is coplanar with and essentially adjacent to the plane of contact between said platens wherein at least one roller contains a driven gear, and

(iii) a horizontally flat metal shelf on the exit side of said rollers and heating platens and essentially coplanar with said nip and plane of contact;

(b) at least one rigid member adapted to attach to said vertical sidewalls and hold them essentially parallel and vertical during assembly and operation;



(c) a motor attached to a sidewall and engaged to said gear such as to drive said roller; and

(d) spring means attached to said vertically stacked rollers such as to hold said pair of rollers under compression.

4,451,321

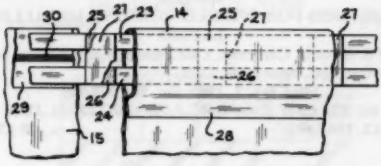
FLEXIBLE VACUUM BAG

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Feb. 16, 1983, Ser. No. 466,970

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—382 **7 Claims**



1. A flexible vacuum bag for use in the lamination of glass sheets with an interposed layer of thermoplastic material, comprising opposite flexible side panels secured together along their edges but having one side edge open to receive the laminations, and magnetic means for sealing said initially open edge to render the bag airtight, said magnetic means including a pair of spaced, parallel, flexible metal strips disposed opposite the outer surface of one of said panels, two rows of permanent magnets secured in spaced relation along said strips, with the magnets in the two rows disposed opposite one another, means magnetically connecting the opposite magnets in the two rows, and a flexible metal strip secured to the inner surface of the second panel opposite the metal strips on the first panel.

4,451,322

APPARATUS FOR FORMING STRUCTURAL SHEETS FROM FIBROUS BIOLOGICAL WASTE

Bolek Dvorak, Calgary, Canada, assignor to Richard A. Moerman and Barry Sullivan, both of Calgary, Canada

Filed Apr. 23, 1982, Ser. No. 371,212

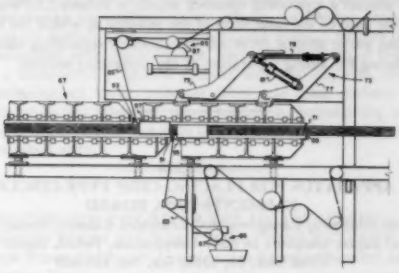
Int. Cl.³ B30B *7/00;* **B29J** *5/00*

U.S. Cl. 156—461 **29 Claims**

1. In an apparatus for forming generally loose fibrous waste matter into a uniformly compacted sheet by the technique of separating a certain volume of the fibrous matter from the remainder thereof, compacting the matter so separated and ramming it through a forming means, and repeating the separating, compacting and ramming operations to form a continuous compacted sheet flowing from the forming means, a precompacting feeder for supplying said fibrous waste matter at a substantially uniform precompacted density from a container of said fibrous matter, said precompacting feeder comprising:

chute means to define a flow path for conducting said fibrous matter from an inlet end at said container to an outlet end at said apparatus;

a plurality of reciprocating compactors speced apart along said flow path adjacent said chute outlet and for precompacting said fibrous matter, said compactors each including a retactile tip on the end thereof which will retract under pressure to reduce stress thereon, each of said compactors being reciprocally operable along an arcuate path of motion between a first position in which it is withdrawn from said flow path, and a second position in which it extends into said flow path, said path of motion being such that movement of said compactors from said first to second positions is in a direction to urge said fibrous matter toward said outlet end; and



actuating means to cause said compactors to reciprocally move between said first and second positions to precompact said loose fibrous matter in said chute, and propel it into said apparatus.

4,451,323

PORTABLE LABEL APPLYING MACHINE

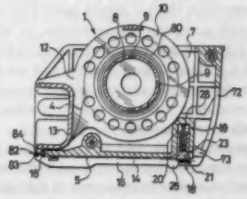
Yo Sato, Tokyo, and Tadao Kashiwaba, Kitagami, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jun. 13, 1983, Ser. No. 503,681

Claims priority, application Japan, Jun. 15, 1982, 57-101442

Int. Cl.³ B65C *9/18, 11/00*

U.S. Cl. 156—541 **12 Claims**



1. A portable label applying machine comprising:

a label cassette comprising a supporting section for supporting a roll of a label strip consisting of labels sequentially adhered on a backing paper strip and for feeding the label strip to a separating section of the cassette; a separating section for receiving the label strip fed thereto and for inverting the backing paper strip alone sufficiently to cause the labels to

separate from the backing paper strip, and a guide section following the separating secton for guiding the backing paper strip which is inverted;

an applier having a manually operable feeding mechanism and a label applying section, the label cassette being detachably mounted on the feeding mechanism; the feeding mechanism engaging the backing paper strip at the guide section for transferring the backing paper strip after the strip is inverted in cooperation with the manual operation of the feeding mechanism so as to separate the labels from the backing paper strip, and the applying section being for applying the labels, which have been separated, to other goods; and

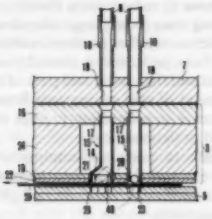
an auxiliary separating member which is mounted forward in the path of the label strip of the position at which the backing paper strip is inverted, the auxiliary separating member being for aiding separation at the separating section.

4,451,324

APPARATUS FOR PLACING CHIP TYPE CIRCUIT ELEMENTS ON A BOARD

Iwao Ichikawa, Kanagawa, and Kenichiro Kaimori, Iwate, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1980, Ser. No. 135,668
Claims priority, application Japan, May 12, 1979, 54-582021
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—562 **12 Claims**



1. An apparatus for placing chip type circuit elements on a board, comprising:

hopper means for storing a plurality of chip type circuit elements;

a plurality of accommodating means for temporarily accommodating circuit elements received from said hopper means, at least two of said accommodating means being oriented in respective different direction with respect to said apparatus;

laterally movable shutter means having an operative position under said accommodating means, in which said shutter means supports said circuit elements in the respective ones of said accommodating means, and an inoperative position, in which said shutter means is removed from said accommodating means to permit discharge of said circuit elements from the latter;

means operative with said shutter means in said operative position for laterally moving said shutter means so as to have components of movement in said different directions for ensuring orientation of the circuit elements in said different directions of the respective accommodating means; and

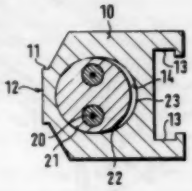
a template located under said shutter means and having a plurality of receiving portions respectively corresponding to said accommodating means and into which the discharged circuit elements are allowed to fall when said shutter means is removed from said accommodating means to said inoperative position.

4,451,325

SEALING JAW FOR FORMING SEAMS IN HEAT-SEALABLE PACKAGING MATERIALS

Wilfried Bubenzer, Engelskirchen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,883
Int. Cl.³ B30B *15/34*; H05B *3/40*
U.S. Cl. 156—583.1 **3 Claims**



1. A sealing device for forming seams in heat-sealable packaging materials having a sealing surface and an elongated bore in parallel with said sealing surface in which an electrically-operated heating element is disposed, the improvement comprising a thick-walled sheath composed of a highly heat-conductive metal disposed in the bore of the sealing device and said heating element is disposed within said thick-walled sheath so that an evenly-distributed temperature is transmitted to the sealing surface of said sealing device,

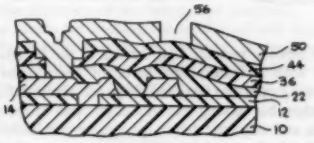
and at least one gap defined by said sheath and said bore of said sealing device on a side of said sheath remote from said sealing surface.

4,451,326

METHOD FOR INTERCONNECTING METALLIC LAYERS

Peter S. Gwozdz, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 7, 1983, Ser. No. 529,920
Int. Cl.³ C23F *1/03*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **28 Claims**



1. A method for forming multiple conductive layers on a semiconductor device, said method comprising:

(a) defining a first conductive layer, having a preselected interconnect pattern, on the device;

(b) applying a first insulating layer over the first conductive layer, said first insulating layer having an irregular profile corresponding to the first conductive layer;

(c) applying a planarization layer over the first insulating layer, said planarization layer having a smoothed profile relative to that of the first insulating layer;

(d) etching both the planarization layer and the insulating layer to substantially remove the planarization layer and to impart a smoothed profile to the first insulating layer;

(e) forming vias through the first insulating layer at preselected locations;

(f) applying a second metal layer over the second insulating layer so that said second metal layer connects with the first metal layer through the vias; and

(g) defining a preselected interconnect pattern in the second layer.

4,451,327

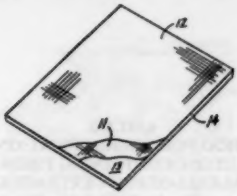
PROCESS AND STRUCTURE FOR ETCHING COPPER

Norvell J. Nelson, Palo Alto, Calif., assignor to PSI Star, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 450,685, Dec. 17, 1982. This application May 25, 1983, Ser. No. 497,887

Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—646 42 Claims



1. A dry process for etching copper, comprising the steps of exposing the copper to a gaseous oxidant in the presence of a catalyst which promotes the reaction of copper with the oxidant, adsorbing oxidized copper produced by the reaction into a receiver, and carrying the oxidized copper away from the reaction in the receiver.

4,451,328

MANUFACTURING TASI-POLYSILICON CONDUCTORS HAVING HIGH-RESISTANCE ELEMENTS BY A LIFTOFF TECHNIQUE

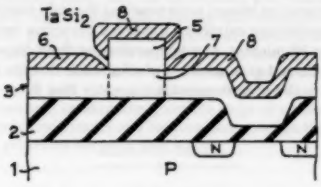
Guy Dubois, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux - E.F.C.I.S., Grenoble, France

Filed Sep. 27, 1982, Ser. No. 423,722

Claims priority, application France, Oct. 27, 1981, 81 20165

Int. Cl.³ H01L 21/22, 21/308

U.S. Cl. 156—656 3 Claims



1. A process for manufacturing high-resistance elements as part of an integrated circuit production procedure, in which access lines to certain elementary transistor terminals are formed of conducting strips, obtained by superimposing a strip of strongly doped polycrystalline silicon and a strip of metal silicide, such resistors being positioned at places where the integrated circuit surface is coated with a thick layer of oxide, said process comprising the following steps:

depositing on an oxide coated integrated circuit surface a layer of polycrystalline silicon possessing high resistivity;

depositing on said polycrystalline silicon layer at places where resistors are required plugs of photosensitive substance;

doping the polycrystalline silicon to endow it with low resistivity except at places protected by said photosensitive substance;

depositing a silicide over the entire surface of the integrated circuit including the unmasked polycrystalline silicon and the plugs;

removing by chemical lift-off the photosensitive plugs and portions of silicide covering them;

selectively masking and etching said silicide and polycrystalline silicon to form said lines, some at least of which pass over the plug positions.

4,451,329

METHODS AND COMPOSITIONS FOR PRODUCING DECORATIVE FROSTING EFFECTS ON GLASS

Gary R. Batchelor, Millville; Carmen A. Russo, Sr., Mays Landing, and Martin Bradley, Vineland, all of N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Aug. 22, 1983, Ser. No. 524,875

Int. Cl.³ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—660 21 Claims

1. Method of selectively etching an image on a glass surface for producing decorative frosting effects, comprising depositing on the surface in the negative of said image a pattern of a crosslinkable resin mask capable, upon crosslinking, of resisting a subsequently applied etchant and also capable, upon crosslinking, of being removed from said glass surface by stripping or hot water or steam treatment, crosslinking said resin, etching said surface with said etchant and removing said crosslinked resin.

4,451,330

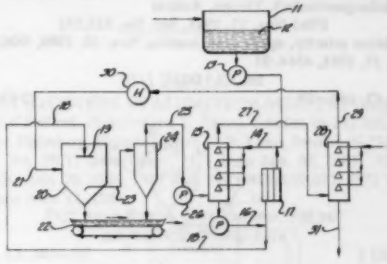
PROCESS FOR THE RECOVERY OF ALKALI METAL SALTS FROM AQUEOUS SOLUTIONS THEREOF

Joseph Vitner, Califon, N.J., assignor to Kalama Chemical, Inc., Seattle, Wash.

Filed Sep. 13, 1982, Ser. No. 417,823

Int. Cl.³ B01D 1/16

U.S. Cl. 159—48.2 10 Claims



1. An integrated process for the production of substantially anhydrous, finely-divided particles of an alkali metal salt selected from the group consisting of alkali metal phenates and alkali metal carboxylates that comprises the following sequential steps:

(a) atomizing an aqueous solution containg 50 percent to 75 percent by weight of said alkali metal salt;

(b) contacting the resulting spray with a stream of inert gas that contains less than 0.5 percent by volume of carbon dioxide and that has been heated to a temperature in the range of 250° C. to 500° C. for the time required to effect dehydration and solidification of the alkali metal salt in said spray;

(c) separating substantially anhydrous, finely-divided particles of the alkali metal salt from a hot outlet inert gas stream that contains up to 20 percent, based on the weight of alkali metal salt in the aqueous solution that was atomized in Step (a), of entrained particles of the alkali metal salt;

(d) passing said inert gas stream through a separator, thereby reducing its content of entrained alkali metal salt particles to 3 percent to 4 percent by weight, based on the weight of alkali metal salt in the aqueous solution that was atomized in Step (a);

(e) passing said inert gas stream into a scrubber that contains an aqueous solution that contains 50 percent to 75 percent

by weight of said alkali metal salt and that is maintained at a temperature in the range of 45° C. to 60° C., thereby dissolving said entrained alkali metal salt particles in said alkali metal salt solution and cooling the inert gas stream to a temperature below 75° C.;

(f) cooling the inert gas stream from which entrained salt particles were removed in Step (e) by contacting it with water at a temperature in the range of 5° C. to 20° C., thereby obtaining a dried inert gas stream;

(g) heating the dried inert gas stream to a temperature in the range of 250° C. to 500° C.;

(h) contacting the hot inert gas stream from Step (g) with the atomized aqueous alkali metal salt solution formed in Step (a);

(i) repeating Steps (c) through (h);

(j) removing from the scrubber the aqueous alkali metal salt solution in which particles of alkali metal salt were dissolved in Step (e);

(k) dividing said solution into a first portion that consists of 10 percent to 90 percent of the solution and a second portion that consists of 10 percent to 90 percent of the solution;

(l) cooling said first portion to a temperature in the range of 40° C. to 60° C. and returning it to the scrubber;

(m) feeding said second portion to the atomizer; and

(n) repeating Steps (a) through (c) and Steps (j) through (m).

4,451,331

PROCESS AND APPARATUS FOR PRODUCING PULP

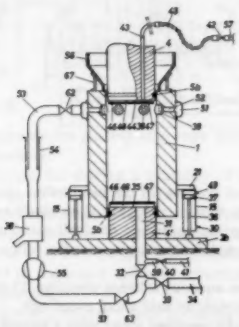
Augustin Raggam, St. Margarethen, and Hermann Rabitsch, Vienna, both of Austria, assignors to Simmering-Graz-Pauker Aktiengesellschaft, Vienna, Austria

Filed Nov. 17, 1981, Ser. No. 322,232

Claims priority, application Austria, Nov. 20, 1980, 5680/80; Oct. 27, 1981, 4564/81

Int. Cl.³ D21C *1/10*

U.S. Cl. 162—18 **10 Claims**



1. A process of producing pulp from impregnated, cellulose-containing starting materials, comprising:

impregnating starting materials in a compacting apparatus with an impregnating liquor under pressure before digesting, said impregnating being effected in the same compacting apparatus as is used for digesting and with an impregnating liquor which contains chemicals in the concentrations required for the digestion in concentratons of 5 to 50%, and under a pressure above 1 bar in order to reduce the unwetted capillary length of the starting material said pressure being applied less than 10 minutes so that the starting materials are impregnated in a cold state said starting materials being compacted in said compacting apparatus before their impregnation so as to reduce their moisture content to less than 50% so that the impregnating liquor can subsequently enter the starting materials;

compacting the impregnated starting materials from the impregnating step above to remove surplus impregnating liquor, thereby obtaining a relatively low hydromodulus of 0.5 to 2;

digesting the impregnated starting materials within a short time of less than 10 minutes, which depends on the digesting temperature, in said compacting apparatus at a digesting temperature of 160° to 300° C.; and

directly supplying heat into the impregnated starting materials by heating of the impregnated starting materials.

4,451,332

METHOD FOR DELIGNIFICATION OF LIGNO-CELLULOSE CONTAINING FIBER MATERIAL WITH AN ALKALI-OXYGEN EXTRACTION STAGE

Göran E. Annergren, Sundsvall; Tjell-Ake Hägglund, Sörberge; Per-Olov Lindblad, Sundsvall; Lars-Åke T. Lindström, and Lars E. Näsman, both of Alnö, all of Sweden, assignors to SCA Development Aktiebolag, Sweden

Continuation of Ser. No. 140,499, Apr. 15, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,070

Claims priority, application Sweden, May 11, 1979, 7904148

Int. Cl.³ D21C *9/12, 9/14, 11/04*

U.S. Cl. 162—30.1 **11 Claims**

1. A process for treating ligno-cellulose containing fiber material comprising the steps of bleaching a ligno-cellulose containing fiber material bleached with chlorine, chlorine dioxide or mixtures thereof; mixing said bleached ligno-cellulose containing fiber material at a pulp consistency of greater than 10% up to 18% with an oxygen-containing gas in a mixer arranged immediately before a substantially non-pressurized upward flowing extraction tower to provide a foam of the pulp suspension having said gas dispersed therein in an amount of from about 4 to about 8 kilograms of oxygen per ton of pulp; passing said foam suspension from the mixer to the upward flowing extraction tower; and extracting the pulp suspension in the upward flowing extraction tower for a reaction time of less than about 90 minutes, at a temperature of from about 50° to about 70° C., and at an addition of alkali such that the final pH measured in the pulp suspension is greater than 9.

4,451,333

PROCESS FOR COOKING LIGNOCELLULOSIC MATERIALS INTENDED FOR THE PRODUCTION OF PAPER PULP WITH 1,2,3,4-TETRAHYDRO-9,10-ANTHRACENE-DIOL

Lucien Bourson, Bois Colombes; Serge Delavarenne, Franchéville Le Haut, and Pierre Tellier, Sainte-Foy-Les-Lyon, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 274,757, Jun. 18, 1981, abandoned, which is a continuation of Ser. No. 57,987, Jul. 16, 1979, abandoned. This application May 14, 1982, Ser. No. 378,218

Claims priority, application France, Jul. 27, 1978, 78 22218

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.³ D21C *3/20*

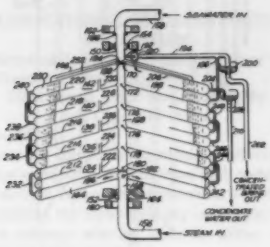
U.S. Cl. 162—77 **4 Claims**

1. A process for cooking lignocellulosic materials which comprises heating the lignocellulosic materials to a temperature between 150° C. and 200° C. in a cooking solution containing caustic soda and 0.01% to 10% by weight of 1,2,3,4-tetrahydro-9,10-anthracene-diol based on the weight of the dry lignocellulosic material to produce a paper pulp.

4,451,334
MULTI-EFFECT ROTARY DISTILLATION PROCESS

Joseph A. Ciocca, and Gregory W. Knowles, both of Huntington, N.Y., assignors to Grumman Allied Industries, Inc., Bethpage, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,100
Int. Cl.³ B01D 1/26, 3/08
U.S. Cl. 203—11 3 Claims



1. A thermally driven, multi-effect distillation process comprising the steps of:

(a) introducing liquid to be distilled into a plurality of evaporating and condensing stages and forming thin film evaporating and condensing layers of said liquid in said plurality of stages while passing heat energy through said plurality of stages in a direction countercurrent to the flow of liquid into said stages,

(b) evaporating the liquid in each of said stages and forming condensate and distilland thereof while transferring substantially all of the heat of condensation therefrom to the next downstream evaporating and condensing stage and while maintaining a minimum temperature differential of about 3° F. between each stage of said plurality of stages, and

(c) separately removing the condensate and distilland from each of said stages while rotating said stages about an axis which passes through the points of introduction to said stages of said liquid to be distilled and said heat energy, at a speed of rotation at least sufficient to generate a centrifugal force and disperse said thin films of said distilland, collect said condensate, generate rings or columns of said liquid in said stages and balance and maintain the differential pressures between said stages.

4,451,335
METHOD FOR PRODUCING FULL COLOR IMAGES ON ALUMINUM

Jack L. Woods, 1517 9th St.; Craig P. Woods, 548 Simeron, and Richard L. Woods, 1517 9th St., all of Ogden, Utah 84404

Continuation of Ser. No. 209,526, Nov. 24, 1980, abandoned. This application Jan. 26, 1983, Ser. No. 461,220
Int. Cl.³ C25D 11/18
U.S. Cl. 204—35 N 8 Claims

1. A method of decorationg articles of aluminum comprising the steps of

anodizing said aluminum article in an aqueous acid electrolyte consisting essentially of from about 165 to 250 grams per liter sulfuric acid, from about 10 to 30 milliliters per liter of an organic carboxylic acid containing at least one reactive group in the alpha-position wherein said reactive group is a hydroxy, amino, keto or carboxyl group, and from about 10 to 30 milliliters per liter of a polyhydric alcohol of from 3 to 6 carbon atoms, with the temperature of the electrolyte being maintained at between about 60° and 75° F. and the current density being maintained at between about 18 to 48 amps per square foot so as to form an anodized layer on the surface of said aluminum article, said layer having a thickness of between about 0.4 and 1.0 mils;

placing a dry film in intimate contact with said anodized layer, said dry film containing a dye capable of subliming when heated;

heating said dry film sufficiently to cause at least a portion of said dye to sublime and condense within said anodized layer; and

thereafter sealing said anodized layer on the surface of said aluminum article.

4,451,336
ADDITIVE-FREE, FAST PRECIPITATING PALLADIUM ELECTROLYTE BATH AND PROCESS

Frank Vangaever; Jacky Vanhumbeeck, both of Brugge; Laurent Danneels, Varsenare; Luc Boone, Oostkamp, and Luc Demaegd, Drongen, all of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

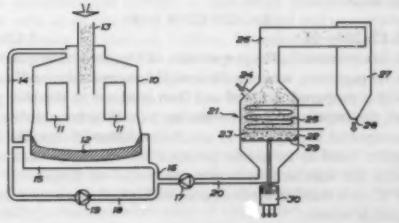
Filed Nov. 19, 1982, Ser. No. 443,011
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148788
Int. Cl.³ C25D 3/50
U.S. Cl. 204—47 10 Claims

1. An additive-free, fast-precipitating electrolyte bath for precipitating palladium layers, said bath being formulated by successively adding to distilled water heated up to about 90° C., phosphoric acid, sufficient ammonia to about neutralize said phosphoric acid and palladium chloride and adjusting the operating pH value of the resultant bath to about 6.5 through 8.5 by additions of ammonia or phosphoric acid as required.

4,451,337
HEAT RECOVERY IN ALUMINIUM-MELTING WORKS

Eyvind Frilund, Hasselvägen 7, Åkarp, Sweden (S-232 02), and Per Holmberg, Hospitalsgatan 12 B, Lund, Sweden (S-223 53)

PCT No. PCT/SE82/00367, 371 Date Jun. 30, 1983, 102(e) Date Jun. 30, 1983, PCT Pub. No. WO83/01631, PCT Pub. Date May 11, 1983
PCT Filed Nov. 4, 1982, Ser. No. 513,967
Int. Cl.³ C25C 3/06, 3/14
U.S. Cl. 204—67 2 Claims



1. A method for heat recovery in a furnace for the manufacture of aluminum by melting electrolysis of alumina, said method comprising the steps of passing furnace gases past a cathode in the furnace for heat exchange therewith while the cathode is being cooled; passing the furnace gases through a bed of alumina while the bed is being fluidized around at least one tube coil for heat exchange between the furnace gases and an external fluid passing through the at least one tube coil; removing entrained solid particles from the furnace gases which have passed through the fluidized bed of alumina, which solid particles are recovered; replenishing the fluidized bed to compensate for material removed therefrom; and supplying the recovered solid particles to the furnace.

4,451,338

PROCESS FOR MAKING A CALCIUM/SODIUM FERRATE ADDUCT BY THE ELECTROCHEMICAL FORMATION OF SODIUM FERRATE

J. Paul Deininger, and Ronald L. Dotson, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 246,789, Mar. 23, 1981, abandoned. This application May 2, 1983, Ser. No. 490,756

Int. Cl.³ C25B *1/30*

U.S. Cl. 204—86 41 Claims

1. A process for producing a calcium/sodium ferrate adduct, utilizing an electrolytic cell having an anolyte chamber containing an anode, a catholyte chamber containing a cathode, and a separator between said chambers, said process comprising the steps of:

(a) maintaining an aqueous mixture of a sodium hydroxide solution and a sodium ferrate-stabilizing proportion of at least one sodium halide salt in said anolyte chamber, said anolyte chamber additionally containing ferric ions;

(b) maintaining an aqueous sodium hydroxide solution in said catholyte chamber;

(c) passing an electric current and impressing a voltage between said anode and said cathode whereby sodium ferrate is formed from said ferric ions in said sodium hydroxide solution in said anolyte chamber;

(d) reacting said sodium ferrate while in said sodium hydroxide solution with a calcium compound to precipitate said adduct from said sodium hydroxide solution; and

(e) recovering said precipitated adduct from said sodium hydroxide solution.

4,451,339

PREPARATION OF BLUE IRON HEXACYANOFERRATE-III PIGMENTS, AND THE PIGMENTS OBTAINED

Joachim Kranz, Ludwigshafen; Wolfgang Habermann, Mainz; Harry Distler, Bobenheim; Helmut Knittel, Ludwigsburg; Karl-Ludwig Hock, Ludwigshafen; Fritz Brunnmueller, Limburgerhof, and Rolf Schneider, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,431

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113777

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—91 8 Claims

1. In a process for the preparation of blue iron hexacyanoferrate-III pigments, wherein the iron-II hexacyanoferate-II compound is prepared, isolated and then oxidized to the blue pigment, the improvement wherein the iron-II-hexacyanoferrate-II compound is prepared by anodic oxidation of metallic iron at pH<7 and at an anode potential of <0.76 V—measured against the standard hydrogen electrode—at from −20° to 150° C., in a reaction medium comprising hydrogen cyanide, in a suitable solvent.

4,451,340

METHOD FOR THE ELECTROLYTIC PRODUCTION OF LEAD

Marco V. Ginatta, Turin, Italy, assignor to Elettrochimica Marco Ginatta SpA, Turin, Italy

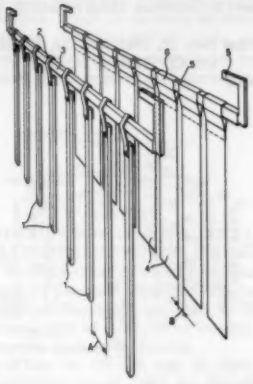
Filed May 26, 1983, Ser. No. 498,425

Claims priority, application Italy, Jun. 4, 1982, 67723 A/82

Int. Cl.³ C25C *1/18*

U.S. Cl. 204—117 20 Claims

1. A method for the production of electrolytic lead from solutions containing lead resulting from both primary extraction processes and scrap processing operations, comprising: electrolyzing the solution between insoluble anodes made of uncoated graphite for oxygen evolution and noncontinuous



cathodes for the production of lead in the presence of cobalt in an electrolyte.

4,451,341

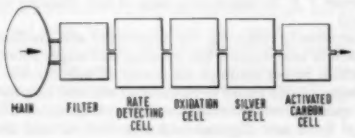
ELECTROLYTIC WATER STERILIZATION SYSTEM

Jeorge Miller, Bogota, Colombia, assignor to Hidrotronic de Colombia, S.A., Colombia

Filed Dec. 29, 1982, Ser. No. 454,499

Int. Cl.³ C02F *1/46*

U.S. Cl. 204—149 12 Claims



1. Electrolytic water sterilization system comprising: a flow rate detecting cell comprising a plurality of electrodes having nonconducting particles situated therebetween for detecting the flow rate of water through the cell in an arrangement wherein the flowing water expands the volume of the nonconducting particles which results in a reduction of the electrical resistance between the electrodes, an oxidation cell comprising electrodes for the production of oxidizing material, a silvering cell comprising electrodes for the production of silver ions, and a pipe connecting a source for the water with the rate detecting cell, the oxidation cell, the silvering cell and the outlet for the sterilized water.

4,451,342

LIGHT DRIVEN PHOTOCATALYTIC PROCESS

Norman N. Lichtin, Newton Center, and Kalambella M. Vijayakumar, Allston, both of Mass., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 3, 1982, Ser. No. 374,559

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R 14 Claims

1. A method for the light driven photocatalytic reduction of carbon dioxide or the bicarbonate ion to at least one compound which comprises contacting at least one metal compound catalyst selected from the group consisting of of CoO, Co_3O_4, Co_2O_3, Cr_2O_3, Cu_2O, CuO, La-Ni-oxide, platinized La-Ni-oxide, La_2O_3, Nd_2O_3, NiO, PbO, and mixtures and combinations thereof with at least one of carbon dioxide and the bicar-

bonate ion in the presence of a reducing agent and in the absence of other carbon sources and separate physical electrolyte and electrodes, and conducting said contacting in the presence of light so that the energy of reduction is essentially supplied by said light.

4,451,343

PHOTO-INITIATORS FOR DECARBOXYLATION REACTIONS

Rosemary Bartoszek-Loza, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,764
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—158 R **14 Claims**

1. A process for the photochemical decarboxylation of an alpha-hydroxy carboxylic acid to form high yields of the corresponding alcohol comprising irradiating a mixture of (a) a solution containing the alpha-hydroxy carboxylic acid and (b) a free radical initiator selected from the group consisting of peroxide and azo compounds.

4,451,344

METHOD OF MAKING EDGE PROTECTED FERRITE CORE

Robert W. Burkhart, Pima, Ariz.; Allen R. Cox, and John D. Hartley, both of Hampshire, England, assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 362,425, Mar. 26, 1982, Pat. No. 4,418,473.
This application Jun. 23, 1983, Ser. No. 507,256
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **20 Claims**

1. A process for depositing films on both side surfaces of a very thin substrate comprising the steps of:

placing at least one substrate in a vacuum deposition system such that the exposed side surfaces of the substrate are disposed perpendicular to and spaced from a target of the film material to be deposited;

operating the vacuum deposition system such that a film layer of the target material is simultaneously deposited on all of said exposed side surfaces of said placed substrate; and

removing the substrate from the system after the required film thickness is deposited on said side surfaces from said operated system.

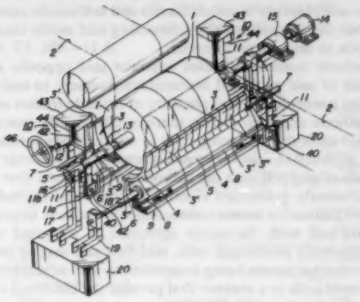
4,451,345

ELECTRODE SUPPORT DEVICE FOR CONTINUOUS ELECTROPLATING BATH

Hiroshi Nemoto; Kazuaki Miyachi, and Akira Komoda, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 31, 1983, Ser. No. 528,165
Int. Cl.³ C25D *17/00*
U.S. Cl. 204—206 **6 Claims**

1. An electrode support device for a continuous electroplating bath, including current supply rotating drums whose parts are immersed in said electroplating bath, a metal strip to be plated being trained about the immersed parts of the rotating drums, and a number of arcuate consumable electrodes arranged side by side along generators of said rotating drums and successively movable on support surfaces of electrode supports so as to supply new consumable electrodes at one ends of the arranged electrodes and remove cosumed electrodes from the other ends, said support device comprising adjusting means for adjusting said electrode supports to remove any unevenness of gaps between said metal strip and said consumable electrodes.

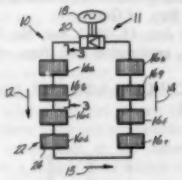


4,451,346

MEMBRANE-ELECTRODE PACK ALKALI CHLORINE CELL

Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 128,684, Mar. 15, 1980, abandoned.
This application Jun. 25, 1981, Ser. No. 276,763
Int. Cl.³ C25B *9/04, 11/02, 15/08, 15/02*
U.S. Cl. 204—228 **10 Claims**



1. A monopolar membrane electrolytic cell connected as one of a predetermined number of adjacently positioned electrolytic cells in an electrical series circuit, said cell comprising:

a plurality of vertical, hollow, foraminous, planar anode frames extending in a direction parallel to an overall path of current flow through said cell;

a plurality of vertical, hollow, foraminous, planar cathode frames extending in said direction and alternating interleaved with said anodes;

a plurality of sheets of cation exchange membrane material oriented in said direction, one of said sheets being pressed between each opposite pair of said anodes and cathodes;

sealing means between each of said frames and said sheets;

pressing means for pressing, transversely to said direction, said frames together in a pack against said membranes and sealing means so as to form a substantially fluid-tight cell;

raw material supply conduits and product withdrawal conduits communicating with the interior of each of said hollow anode and cathode frames;

a plurality of substantially horizontal anode conductor rods extending into said anode frames in said direction from a first side of said pressed pack;

a plurality of substantially horizontal cathode conductor rods extending into said cathode frames in said direction from a second side, opposite to said first side, of said pressed pack;

an anode terminal outwardly extending in said direction from said first side of said pack;

a cathode terminal outwardly extending in said direction from said opposite second side of said pack;

an anode current collector adjacent said first side of said pack and oriented transversely to said direction connected to said plurality of anode frames and said anode conductor rods thereby electrically connecting said anode conductor rods to said anode terminal;

a cathode current collector adjacent said opposite second side of said pack and oriented transversely to said direction connected to said plurality of cathode frames and said cathode conductor rods thereby electrically connecting said cathode conductor rods to said cathode terminal;

first intercell connector means connecting said anode terminals of said cell with the cathode terminals of a first of said adjacently positioned electrolytic cells and second intercell connector means connecting said cathode terminals of said cell with the anode terminals of a second of said adjacently positioned cells, said first and second intercell connector means being connected to said adjacently positioned cells in a manner that permits the electrical current to be rapidly and safely disconnected to remove said cell from the series circuit;

the total number of said anode and cathode frames in said pressed pack being within the range of from about 5 to about 50; and

the ratio of thickness of said pressed pack to the height of said cathode and anode frames being no more than approximately 2:1 thereby facilitating disconnecting said first and second intercell connector means between the adjacently positioned electrolytic cells.

4,451,347

FILTER-PRESS TYPE ELECTROLYZER FOR WATER

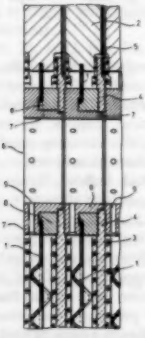
Heinz Wüllenweber, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,533

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101120

Int. Cl.³ C25B *9/00, 1/10, 1/12, 1/08*

U.S. Cl. 204—258 **4 Claims**



1. In a filter-press-type electrolyzer for water comprising pressure-resisting decomposing cells, each of which comprises an electrolyte chamber divided by a diaphragm into two electrode compartments and enclosed on the outside by two cell frames whose sections are electrically insulated from each other by an interposed sealing ring, and which is separated on the sides from the adjacent cells by metallic cell-separating partitions, at least three ducts, each of which is composed of sections and which respectively serve to supply electrolyte and to discharge hydrogen and oxygen extend through the cells being provided, the sections of the ducts consisting of sleeves which are resistant with respect to the operating conditions and insulated from each other and extend through the cell-separating partitions in openings framed with metal rings, the improvement wherein a metal ring is secured to each of the cell-separating partitions by a gas- and liquid-tight welded joint and the sleeves are slidably fitted in the metal rings.

4,451,348

FUNCTIONAL ELECTRODE

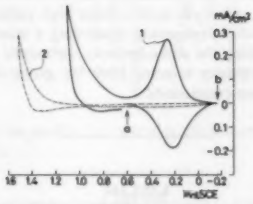
Kingo Itaya, Tagajo; Kimio Shibayama; Shinobu Toshima, both of Sendai; Tatsuaki Ataka, and Koji Iwasa, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,790

Claims priority, application Japan, Jan. 12, 1982, 57-3044

Int. Cl.³ C25B *11/08;* **C25D** *11/34;* **H01M** *4/88*

U.S. Cl. 204—290 R **12 Claims**



1. A functional electrode usable as an electrochromic display electrode, as a catalyst electrode effective to catalyze the evolution of oxygen and chlorine, and the like comprising: a conductor having electric conductivity at least at the surface, and a colored film deposited on the surface of the conductor, wherein said colored film is comprised of a compound of the formula $M^IM(III)[M'(II)\ (CN)_6]$ or $M(III)_4\ [M'(II)\ (CN)_6]_3$ wherein M(III) is Fe(III), Ru(III) or Os(III), M'(II) is Fe(II), Ru(II) or Os(II) and M^I is an alkali metal cation, with the proviso that said compound does not contain both Fe(III) and Fe(II).

4,451,349

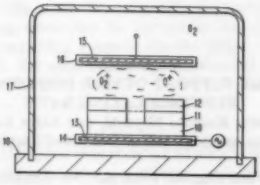
ELECTRODE TREATMENT FOR PLASMA PATTERNING OF POLYMERS

James T. Yeh, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,629

Int. Cl.³ C23C *15/00;* **C23F** *1/00*

U.S. Cl. 204—298 **9 Claims**



1. Polymer etching apparatus, for patterning a film of polymer on a sample, including a reaction chamber having an electrode, portions of which electrode are in the vicinity of the sample being etched, characterized by:

a coating, on portions of electrode in the vicinity of the sample being etched, which portions are to be exposed to accelerated particles which cause sputtering of electrode material, of a layer of material of

the same material as the material being etched,

whereby the coating on the electrode etches at a rate compa-

rable to the etch rate of the film to be etched from the surface of the sample, eliminating the effect of backscattering of electrode material onto the etch areas of the sample.

4,451,350
SENSOR FOR MEASURING DENSITY OF OXYGEN IN MOLTEN METAL

Yutaka Tsuchida; Mikio Mugita, both of Fukuyama; Yutaka Nakano, Funahashi; Naoaki Sasaki, Tokyo; Kenki Ishizawa, Bizen, and Hiroshi Kuroshima, Okayama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo; Osaka Oxygen Industries Ltd., Osaka and Shinagawa Shirorenga Kabushiki Kaisha, Tokyo, all of, Japan

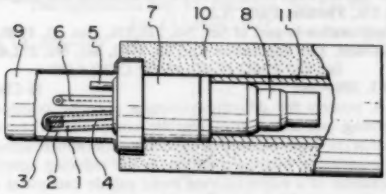
PCT No. PCT/JP81/00214, 371 Date Mar. 29, 1982, 102(e) Date Mar. 29, 1982, PCT Pub. No. WO82/00892, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 3, 1981, Ser. No. 367,227

Claims priority, application Japan, Sep. 5, 1980, 55-122412

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—422 **11 Claims**



1. In an oxygen sensor for measuring the oxygen content of molten metal comprising a solid ion conductive electrolyte having an inner and an outer surface, said solid electrolyte having a protective coating containing a binding agent on the outer surface thereof intended to be immersed in the molten metal being measured,

the improvement comprising said protective coating containing powders of at least one metallic fluoride.

4,451,351
METHOD OF LIQUEFACTION OF CARBONACEOUS MATERIALS

Clifford R. Porter, Arvada, Colo., and Herbert D. Kaesz, Los Angeles, Calif., assignors to Pentanyl Technologies, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 207,714, Nov. 17, 1980, Pat. No. 4,325,802. This application Apr. 19, 1982, Ser. No. 369,773

Int. Cl.³ C10G *1/06, 1/00;* C10B *43/00;* C07C *1/00*

U.S. Cl. 208—10 **19 Claims**

1. A method of converting carbonaceous materials to liquid products under conditions of temperature and pressure which do not produce significant thermal bond rupture in the carbonaceous materials consisting essentially of:

contacting the carbonaceous material with a solvent/solute system consisting of:

(a) an organic phase solubilizing agent containing more than 50% by weight of a member selected from the group consisting of aromatic phenols, polycyclic phenols, substituted phenols and mixtures thereof; and

(b) an inorganic phase comprising an aqueous solution of a compound having a cation selected from the group consisting of alkali and alkaline-earth metals at a temperature less than about 350° C. and a pressure of at least 400 psig.

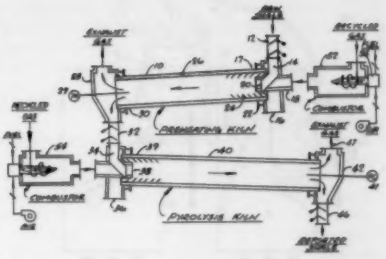
4,451,352
PROCESS OF PRODUCING OIL BY PYROLYSIS

Noel H. Twyman, Canyon Lake, Calif., assignor to Automated Production Systems Corporation, Tustin, Calif.

Filed Jul. 20, 1981, Ser. No. 285,038

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 R **12 Claims**



1. A process for recovering or obtaining hydrocarbon compounds from naturally occurring deposits of a mineral matrix interpolated with kerogen which includes heating the raw material employed for a period and at a temperature which together are sufficient so that pyrolysis products from the kerogen are produced and volatilized and then separating these products from the remainder of the mineral matrix in which the improvement comprises:

the heating consisting of two separate heating steps—an initial step and a final step—which are carried out separately from one another by concurrent movement of a hot gas stream and the material being heated through the kiln in which the step is performed with the second step following the first so as to minimize any decrease in the temperature of the heated material as the material passes from one step to the other,

the material being treated being heated during the initial step by contact with a hot gas stream containing insufficient oxygen for there to be any noticeable combustion to occur during this initial step, as the material is agitated for a period and to a temperature which together are sufficient so that if any further heating would occur pyrolysis products of the kerogen would be vaporized to a significant extent,

separating the material heated during the initial step from the hot gas stream used to heat this material,

The material being treated being further heated during the second, final step by contact with a different hot gas stream as this material is agitated for a period and to a temperature which together are sufficient to produce and volatilize substantially all the volatiles which can be obtained or derived from the mineral material being processed, and

then separating this material from the hot gas stream and the volatiles produced during the second final heating step.

4,451,353
SOLVENT DEWAXING WAXY HYDROCARBON DISTILLATES USING A COMBINATION POLY ACRYLATE POLYMER AND POLYMETHACRYLATE POLYMER DEWAXING AID

Cedric L. Briens, Richmond; Bruce M. Sankey, and Patrick C. Ewener, both of Sarnia, all of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

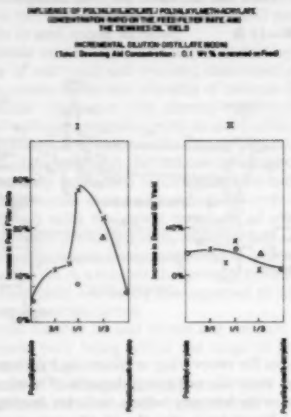
Filed Sep. 29, 1982, Ser. No. 426,676

Int. Cl.³ C10G *73/04*

U.S. Cl. 208—33 **10 Claims**

1. A solvent dewaxing process comprising mixing a waxy hydrocarbon oil distillate with dewaxing solvent and dewaxing aid wherein said dewaxing aid comprises a mixture of:

A. a poly acrylate; and
B. an n-alkyl methacrylate polymer;
wherein components (A) and (B) constituting the dewaxing aid are used in a weight ratio to each other ranging from



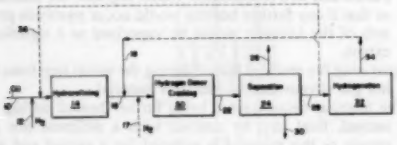
about 1/100 to 100/1 of (A)/(B), and chilling said oil/dewaxing solvent/dewaxing aid mixture to form a slurry comprising solid particles of wax and a solution of dewaxed oil and dewaxing solvent and separating said wax from said dewaxed oil solution.

4,451,354

PROCESS FOR UPGRADING HYDROCARBONACEOUS OILS

Gordon F. Stuntz, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1983, Ser. No. 454,875
Int. Cl.³ C10G *65/12, 69/02*
U.S. Cl. 208—56 **7 Claims**



1. A process for upgrading a sulfur-containing heavy hydrocarbonaceous oil feed comprising heavy constituents, including at least 10 volume percent materials boiling above 1050° F., which consists essentially of the steps of:

(a) contacting said heavy oil feed with a hydrorefining catalyst in the presence of added molecular hydrogen in a hydrorefining zone at hydrorefining conditions such as to convert at least a portion of the heavy constituents of said oil to lower boiling hydrocarbons, said hydrorefining conditions including a temperature ranging from about 680° to 775° F. and a hydrogen partial pressure ranging from about 800 to about 1500 psig to produce a hydrorefined oil;

(b) contacting at least a portion of said hydrorefined oil in the presence of a hydrogen donor diluent and of molecular hydrogen in a cracking zone to crack at least an additional portion of said heavy constituents to lower boiling hydrocarbon, said cracking conditions including a temperature ranging from about 775° to 850° F. and a hydrogen partial pressure ranging from about 250 to 1500 psig; and

(c) recovering an upgraded hydrocarbonaceous oil.

4,451,355

VANADIUM PASSIVATION IN A HYDROCARBON CATALYTIC CRACKING PROCESS

Bruce R. Mitchell, Lower Burrell, and Roger F. Vogel, Jefferson Township, Butler County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sep. 28, 1983, Ser. No. 536,754
Int. Cl.³ C10G *11/05;* B01J *21/06, 29/06*
U.S. Cl. 208—113 **8 Claims**

1. A process for the conversion of a hydrocarbon oil feed having a significant concentration of vanadium to lighter oil products which comprises contacting said feed under conversion conditions with a cracking catalyst containing a calcium-containing additive selected from the group consisting of calcium-titanium, calcium-zirconium, calcium-titanium-zirconium oxides and mixtures thereof.

4,451,356

CATALYTIC DEHYDROXYLATION OF PHENOLS

Wim J.M. Pieters, Morristown, N.J., and Gerard M. Prilutski, New Castle, Del., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 218,526, Dec. 22, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,455
Int. Cl.³ C10G *17/00, 45/00;* C07C *1/20*
U.S. Cl. 208—263 **16 Claims**

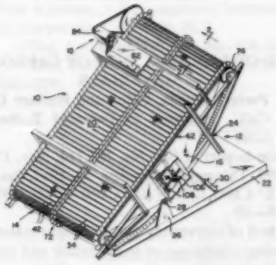
1. A process for dehydroxylating a phenolic compound comprising contacting said phenolic compound or mixture thereof in the vapor phase with a reducing atmosphere substantially comprising hydrogen sulfide, as the reducing agent, in the presence of a sulfur-tolerant metal sulfide catalyst at elevated temperature, wherein said atmosphere further comprises from about 0.001 to about 15 volume percent hydrogen gas.

4,451,357

APPARATUS FOR DRY PLACER MINING AND METHOD OF OPERATING SAME

Gordon LaVigne, Box 153 Tiger Star Rt., Colville, Wash. 99114

Filed May 17, 1982, Ser. No. 379,190
Int. Cl.³ B03C *7/08*
U.S. Cl. 209—131 **18 Claims**



1. Apparatus for dry placer mining to concentrate metallic constituents from a gravel mix comprising same, said apparatus comprising:

a. a frame for supporting and guiding an endless separation belt along a closed path including an upwardly inclined segment for receiving a gravel mix containing a low concentration of metallic constituents;

b. endless separation belt means, including:

(i) a woven mesh belt member having raised loop elements and transversely extending interstices;

(ii) a plurality of riffle members disposed in spaced, gener-

ally parallel relationship through selected ones of said interstices; and,

(iii) a composite fabric member secured to the underside of said mesh belt, comprising a layer of air-pervious polymeric foam disposed intermediate upper and lower layers of cloth fabric; and,

c. fluidizing means for passing a fluidizing gas upwardly through said separation belt substantially uniformly along and about said upwardly inclined segment to fluidize said gravel mix and concomitantly establish an electrostatic charge proximate said separation belt; wherein the combined fluidization of gravel and electrostatic charge effectuate a substantial separation of said metallic constituents from said mix and retention of the former proximate said riffles thereby concentrating the metallic constituents for recovery.

4,451,358

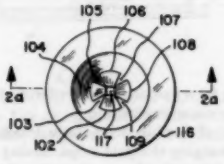
NONCIRCULAR REJECTS OUTLET FOR CYCLONE SEPARATOR

David E. Chupka, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 322,831, Nov. 19, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,191

Int. Cl.³ B04C 5/14

U.S. Cl. 209—144 **9 Claims**



1. In a cyclone separator comprising means forming a separation chamber, a first end thereof having a generally circular cross-section and including a tangential inlet to said separation chamber through which a fluid suspension of material enters, and a central outlet therefrom through which the accepts portion of said fluid suspension exits said separation chamber, the opposite end of said separation chamber tapering toward an outlet of smaller flow area than said chamber through which the rejects portion of said fluid suspension exits said separation chamber, the improvement comprising wall means, said wall means including a plurality of tapering wall portions extending along the longitudinal axis of said separator which define an outlet having a non-circular cross-section, said outlet being continuously open during the operation of said separator.

4,451,359

HYDRAULIC FLOW DISTRIBUTOR IN GOLD SEPARATOR AND METHOD

Daniel Osterberg, 5728 Tarpey Dr., Fresno, Calif. 93727

Filed Mar. 30, 1982, Ser. No. 363,533

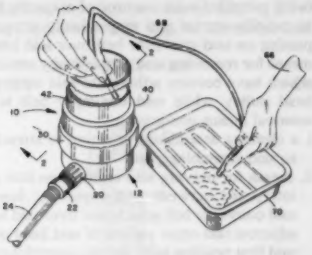
Int. Cl.³ B03D 5/68

U.S. Cl. 209—158 **5 Claims**

1. A gold separator comprising:

an upright riser tube of uniform cross section defining an upright separation zone;

a flow distributor extending across the entire bottom of said tube, said flow distributor having a body comprised of upper and lower rings, said rings being secured together, a perforated plate supported by said lower ring, a coarse screen supported by said upper ring, a disc of fibrous material positioned adjacent said perforated plate and a fine screen positioned adjacent said coarse screen, said fine screen and said disc of fibrous material being dimensioned to fill the space between said perforated plate and said coarse screen, said flow distributor providing non-turbulent water upflow through said separation zone in said riser, with minimal transverse differences in water flow across said separation zone so that upflowing water can fluidize a bed of heavy concentrates to permit separation thereof;



a base, said base supporting said flow distributor and supporting said upright riser and a water connection on said base for supplying water for upflow through said flow distributor and upflow through said riser tube for providing non-turbulent water upflow to fluidize a bed of heavy concentrates in said separation zone to permit separation thereof.

4,451,360

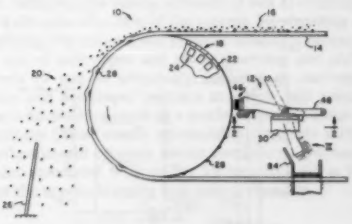
DEVICE FOR REMOVAL OF MAGNETIC PARTICLES FROM A MAGNETIC SEPARATOR

Robert W. Salmi, Township of Arbo, County of Itasca, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1982, Ser. No. 342,561

Int. Cl.³ B03C 1/18, 1/30

U.S. Cl. 209—230 **20 Claims**



1. Apparatus for removing adherent magnetically attractable particles comprising:

a. a surface to which the particles are attracted;

b. source of magnetic force disposed beneath said surface;

c. a cleaning assemblage operatively disposed in relation to said surface, said cleaning assemblage comprising bracket means and a plurality of magnetically soft tines of varying diameters to affect attraction of particles of varying sizes respectively, each of said tines being affixed by one end thereof to said bracket means; and,

d. means for moving said assemblage into a first position in which said tines are disposed substantially normal to said surface and in close proximity with said surface so as to cause said magnetic force to be concentrated on said tines to attract said adherent particles to said tines, and for moving said assemblage to a second position away from said surface for the discharge of the particles from said tines.

10. An apparatus for separating magnetically attractable particles from particles which are not magnetically attractable which comprises:

a. a continuously moving conveyor belt operably disposed to carry a mixture of said particles to a deposit point;

b. a head pulley having an outer surface operatively engaging said conveyor belt such that said conveyor belt is disposed about said head pulley so as to define upper and lower sections of said conveyor belt, said head pulley being provided with a source of magnetic force operative to radially attract said magnetically attractable particles passing on said conveyor belt over said head pulley; and,

c. means for removing said magnetically attractable particles which have become adhered to said outer surface of said head pulley while said conveyor belt is moving, said removal means comprising:

i. a cleaning assemblage effective to attract said particles to said assemblage; and

ii. means for moving said assemblage into a first position interposed between said upper and lower sections of said conveyor belt which pass over said head pulley and adjacent said outer surface of said head pulley so that in said first position said cleaning assemblage is disposed in close proximity to and substantially normal to said surface for attracting said adherent particles to said cleaning assemblage and for moving said cleaning assemblage to a second position away from said surface for discharge of the attracted particles from said cleaning assemblage.

4,451,361

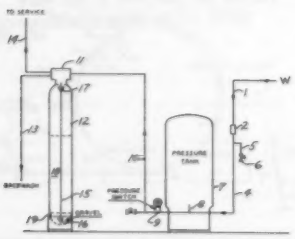
APPARATUS FOR REMOVING DISSOLVED IRON FROM WATER

Laurene O. Paterson, Box 953, 1219 E. Church St., Adrian, Mich. 49221

Continuation-in-part of Ser. No. 103,322, Dec. 14, 1979, abandoned, Ser. No. 145,657, May 2, 1980, abandoned, and Ser. No. 210,923, Nov. 28, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,164

Int. Cl.³ C02F *1/64*

U.S. Cl. 210—136 **19 Claims**



1. Apparatus for removing iron from water which comprises in combination, and in sequential fluid flow connection:

(1) an injector mixer subjecting water having iron therein to high turbulence and high shear to a degree sufficient to colloidalize existing insoluble iron hydrates and form colloidally dispersed iron hydrates from substantially all the dissolved iron present, thereby providing the iron in the form of micelles having a surface charge; said injector-mixer having in sequential fluid communication a nozzle through which a first fluid selected from the group consisting of water, air and oxygen may be passed; a mixing chamber and a diffuser means for raising the pressure of said fluid to that of a downstream system; means for introducing into said chamber a second fluid selected from the group consisting of water, air and oxygen, one of said first and second fluids being water, the other of said first and second fluids being a gas selected from the group consisting of air and oxygen; and auxiliary valving to provide sufficient gas to form colloidally dispersed hydrated iron oxides having a surface charge;

(2) means for maintaining the so-treated water under a pressure within the range from about 10 to 500 psig;

(3) a tank comprising a bed of particulate material having electrostatically charged surface area capable of adsorbing and removing said iron hydrates from the water;

(4) means for passing the water from the injector mixer into the tank and through the bed; and

(5) means for delivering water having low iron residuals from the bed.

4,451,362

FILLING FOR PERCOLATING FILTERS FOR BIOLOGICAL WASTE WATER PURIFICATION

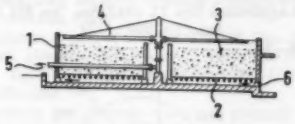
Hans-Hugo Spelsberg, Osnabruck, Fed. Rep. of Germany, assignor to Felix Schoeller, Jr., GmbH & Co., KG, Osnabruck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 277,114, Jun. 25, 1981, abandoned. This application Feb. 17, 1983, Ser. No. 467,258

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047967

Int. Cl.³ B01D *39/04*; C02F *3/04*

U.S. Cl. 210—150 **18 Claims**



1. A filling for a percolating filter for the biological purification of waste water comprising:

a plurality of flexible, irregularly touching, randomly arranged hanging elongate strips, having a width of up to 8 cm and a length of several meters the thickness of said strips varying between maximum and minimum thicknesses across the width of said strips, said maximum and minimum thicknesses extending longitudinally of the strips between the longitudinal edges thereof and causing said strips to be stressed and curled; and

means supporting said strips in said randomly arranged relationship and such that the longitudinal edges and the longitudinally extending maximum and minimum thicknesses of said strips extend substantially vertically and in the direction of flow of the waste water when the waste water is being purified.

4,451,363

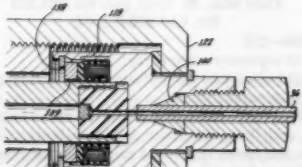
CARTRIDGE FOR LIQUID CHROMATOGRAPH

Robert Brownlee, Los Altos Hills, and Jeremy W. Higgins, Los Altos, both of Calif., assignors to Brownlee Labs Inc., Santa Clara, Calif.

Filed Mar. 3, 1982, Ser. No. 354,394

Int. Cl.³ B01D *13/08*

U.S. Cl. 210—198.2 **6 Claims**



1. In a high-pressure liquid chromatographic system, a replaceable column cartridge for carrying a packing, said car-

tridge comprising an elongate tube having a concentric bore therethrough, a packing of particulate material disposed in said bore, means forming enlarged first and second recesses concentrically with said bore and in alignment with the bore at each end of the tube, each such recess having a cylindrical sidewall of a diameter larger than the bore and an internally disposed flat bottom wall of annular shape, first and second generally cylindrical seal plugs each having opposing inner and outer parallel faces and dimensioned to slide in a close fit within each respective recess sidewalls and further dimensioned so that, when inserted into the end fitting of a liquid chromatograph, the plugs and cartridge form a self-suporting structure for containing the packing and each plug being adapted to be placed in end-to-end compression resisted solely by the plug surfaces bearing upon the bottom wall of each recess while confined by the recess sidewall, each plug being adapted to bear at its other end in sealed relation upon an end fitting.

4,451,364

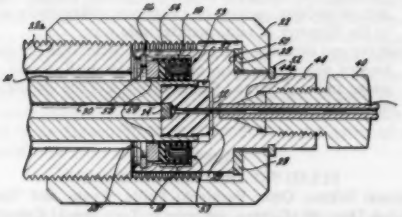
HIGH PRESSURE SEAL AND COUPLING

Jeremy W. Higgins, Los Altos, and Robert Brownlee, Los Altos Hills, both of Calif., assignors to Brownlee Labs Inc., Santa Clara, Calif.

Filed Mar. 3, 1982, Ser. No. 354,395

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **5 Claims**



1. Apparatus for coupling a tubular column to a fluid carrying line comprising an end fitting including a body having a bell opening at one end forming a chamber for receiving the end of a tubular column, means connecting the other end of the fitting to the fluid line,

a first seal interposed between the end of the column and the fitting,

means forming a first annular recess formed interiorly in the chamber wall surrounding the column,

a secondary seal of the hydraulic type disposed in said first recess and making circumferential sealing contact to the outer wall of the column,

said end fitting bell having a continuing section extending beyond the first recess and secondary seal,

means forming a second recess or groove formed interiorally in the continuing section,

retaining ring means disposed in said second recess for securing said second seal in position against the secondary seal and against axial movement of the same.

4,451,365

COLUMN CLAMPING DEVICE FOR CHROMATOGRAPHY

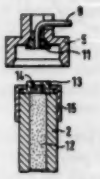
Günther Sättler, Reinheim; Werner Gunkel, Rossdorf; Manfred Witzgall, and Reinhard Look, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,667

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143075

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **4 Claims**



1. In a device for rapidly changing columns of the type generally used in liquid phase chromatography, said device comprising connectors for each end of a column with respective inlet and outlet for passage into and out of the column of the mobile phase, and the connectors being adapted so that there is no dead volume between column and connector, when connected thereon, due to the combined action of sealing means employed therewith, the improvement wherein said connectors comprise:

upper and lower clamping and sealing elements (3 and 5) having sealing members (11, 20, 23 and 28) extending therefrom and said sealing member shaped to be compatible with the ends of the column to which they are to be sealed against at the inlet and outlets of the column, with said sealing elements having means for passing the liquid phase therethrough, and at least one of said upper and lower clamping and sealing elements (3 and 5) being movable in the axial direction of the column for clamping and unclamping the column; and pressure means for moving at least one of said upper and lower clamping and sealing elements (3 and 5) selectively between an unclamped position and a clamped position at which said pressure means is adapted for exerting a predetermined pressure on the column (2) to ensure substantially complete sealing, and wherein said pressure means comprises a pneumatic cylinder associated with means for moving said at least one of the upper clamping and sealing elements.

4,451,366

SEPARATOR

Bernard Smisson, Bristol, England, assignor to Hydro Research and Development (UK) Ltd., Bristol, England

Filed Aug. 5, 1981, Ser. No. 290,665

Claims priority, application United Kingdom, Aug. 11, 1980, 8026095

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—209 **11 Claims**

1. A separator comprising:

a substantially closed chamber having a generally cylindrical outer wall and oppositely disposed end walls;

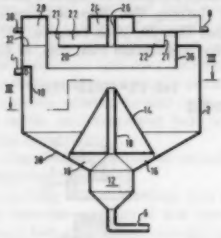
a mixture inlet directed into the chamber to promote within the chamber a primary, circulating flow about a swirl axis extending between the end walls and a secondary, toroidal flow coaxial with the swirl axis;

a first outlet disposed centrally in one of the end walls of the chamber;

a second outlet disposed in the region of the other end wall of the chamber; and

a flow modifying member provided within the chamber

adjacent the first outlet and having a passage therein, the flow modifying member defining with the said one end wall an annular slot which is disposed radially inwardly of the outer wall of the chamber, the flow modifying member being adapted and positioned to cause a portion of the secondary flow to pass radially inwardly, with respect to the swirl axis, through the annular slot and away from the said one end wall through the passage in the flow modifying member.



4,451,367

SEDIMENTATION TANK

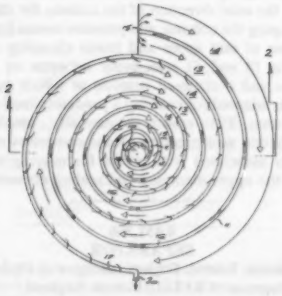
Antonio Ruggeri, Johannesburg, South Africa, assignor to Pasquale Vannucci, Johannesburg, South Africa, a part interest

Continuation of Ser. No. 162,331, Jun. 23, 1980, abandoned. This application Dec. 15, 1981, Ser. No. 330,638

Claims priority, application South Africa, Jun. 28, 1979, 79/3222

Int. Cl.³ C02F *1/52*; B01D *21/01*

U.S. Cl. 210—207 **2 Claims**



1. A sedimentation tank comprising a pair of walls extending from a common pole towards an inlet for flocculated liquid along substantially sprial paths such that the distance between the adjacent turns of each wall, measured along a substantially radial line from the common pole increases with increasing distance away from the common pole, a flocculation flume in one wall and an overflow launder in the second wall, the flume and the launder each having sides the distance between which likewise increases with increasing distance from the common pole, the flocculating flume terminating at the inlet and the launder terminating at a discharge substantially diametrically opposite the inlet.

2. The tank claimed in claim 1 including a mixing well at the common pole for adding flocculating agents which mixing well leads into the flocculating flume.

4,451,368

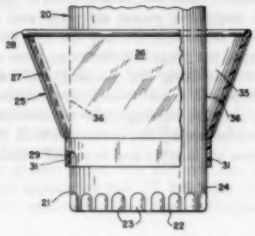
ANNULAR DRIP COLLECTOR AND CAP

Michael N. Pandelena, 15 Old Ferry Rd., Methuen, Mass. 01855, and Peter Strozza, 322 Oak St., Methuen, Mass. 01844

Continuation-in-part of Ser. No. 431,763, Sep. 30, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,709

Int. Cl.³ B01D *27/00*

U.S. Cl. 210—238 **11 Claims**



1. In combination with an oil filter cartridge of the type having a cylindrical side wall of generally uniform diameter, a closed end and an opposite, threaded end, for screw-on attachment to a motor block:

a disposable oil drip collector comprising;

a funnel shaped main body having a cylindrical outer closure wall with a central opening substantially equal in diameter to the diameter of said cartridge side wall and sleeved thereon intermediate of the height thereof;

a generally frustro-conical side wall, flaring outwardly from said outer closure wall, at an increasingly spaced distance from said cartridge side wall, and terminating in a rim, having a circular opening of enlarged diameter, substantially greater than the diameter of said cartridge side wall and located beyond the threaded end of said cartridge;

and an annular cap, having a peripheral skirt snap fitted over, and around, said circular rim of said main body, and including an integral, inturned, annular flange with a central circular opening of a diameter substantially equal to the diameter of said cartridge side wall;

said cap and said main body forming an oil spillage reservoir, located adjacent portion of the outside wall of said cartridge and said cap and flange sealing said rim against said motor block to reduce spillage.

4,451,369

FLUID SEPARATION APPARATUS

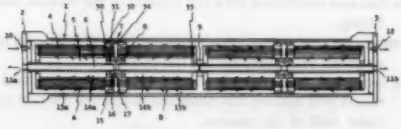
Masaaki Sekino, Otsu; Yoshiyuki Fujita, Kyoto, and Tetsuo Ukai, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Dec. 17, 1981, Ser. No. 331,713

Claims priority, application Japan, Dec. 18, 1980, 55-180171

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.1 **9 Claims**



1. A fluid separation apparatus which comprises at least one pair of unit structures which are arranged uniaxially in series within a cylindrical pressure vessel, each pair of unit structures comprising:

a pair of cylindrical hollow fiber assemblies having a selective permeability;

a pair of cores, each arranged internal to and concentric with a respective one of the cylindrical hollow fiber assemblies;

a pair of permeating fluid pipes, each arranged internal to and concentric with a respective one of the cores;

collecting means connected to one end of each pair of cylindrical hollow fiber assemblies for collecting permeated fluid from the cylindrical hollow fiber assemblies, said collecting means being connected to adjacent ends of their respective cylindrical hollow fiber assemblies; and

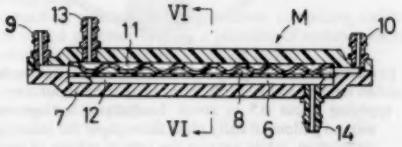
fitting means connected to said collecting means and to corresponding ends of each core and permeating fluid pipe, said fitting means being adapted so that the collected permeated fluid passes to the permeating fluid pipes for passage there-through and the remaining fluid passes between the cores.

4,451,370

MEMBRANE SEPARATION ELEMENT

Masataka Murai, and Kiyoshi Ishii, both of Himeji, Japan, assignors to Daicel Chemical Industries Ltd., Hyogo, Japan

Filed Jun. 14, 1982, Ser. No. 388,236
Claims priority, application Japan, Jun. 19, 1981, 56-95469
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.1 **12 Claims**



1. A membrane separation element for filtering a fluid, comprising an inlet, an outlet, and a pair of corrugated semipermeable membranes, each of said membranes having an active surface side and another side, each of said membranes defining a plurality of parallel passages for the fluid to be filtered on the active surface side thereof, and a plurality of parallel passages for the filtrate fluid on the other side thereof, said membranes being placed on each other in such a manner that the passages on the active surface side of one of said membranes face and cross the passages on the active surface side of the other membrane, said membranes being sealed together along a pair of opposite edges which are parallel to the direction in which the fluid to be filtered flows from the inlet to the outlet of said element.

4,451,371

APPARATUS FOR SEPARATING LIQUID FROM A SLURRY

William H. Peck, 5604 W. Prue Rd., San Antonio, Tex. 78240

Filed Jan. 10, 1983, Ser. No. 456,862
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—325 **27 Claims**

1. Apparatus for separating liquid from solids contained in a liquid-solid slurry, which comprises, in combination, driven main shaft means, a centrifugal concentrator, a centrifugal separator, means mounting said concentrator and said separator, respectively, on said shaft means for conjoint rotation about the axis of the shaft means when driven, said concentrator comprising:

a concentrator base plate centrally mounted on said shaft means for rotation about said axis of the shaft means,

a concentrator feed slurry reservoir centrally mounted on said base plate for rotation therewith,

a restrictive reservoir discharge outlet at the perimeter of said reservoir, whereby feed slurry is discharged from the reservoir in a stream nominally to follow a spiral flow path commencing at said outlet and continuing radially therefrom over said base plate, upon rotation of the base plate about said axis to impart centrifugal force to the slurry, and

a spirally curved perforate vane mounted on said base plate for rotation therewith and disposed to intersect said stream at an acute angle to the direction of flow, thereby to cause a fractional portion of the liquid in the slurry stream to pass through the vane therealong while the remainder of the stream travels along the vane to a radially outer concentrator discharge point, whereby the slurry is concentrated,

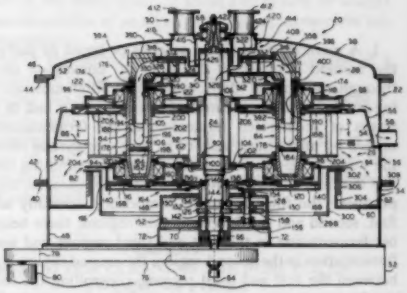
said separator comprising:

a carrier centrally mounted on said shaft means for rotation about said axis of the shaft means conjointly with said concentrator base plate,

a filter basket eccentrically mounted on said carrier for orbital movement about said shaft means axis and for rotation about a centrally disposed basket axis in spaced parallel relation to the shaft means axis,

said filter basket including a base plate normal to and rotatable about said basket axis, and adapted to receive feed slurry on a central region thereof,

said filter basket also including a spirally curved perforate



vane mounted on said basket base plate for rotation therewith and extending radially outwardly from said central region,

a separator feed slurry reservoir mounted in juxtaposition to said central region for rotation with said basket base plate, and

a restrictive reservoir discharge outlet at the perimeter of said separator feed slurry reservoir and disposed adjacent to the radially inner end of said basket vane for supplying slurry to the vane adjacent to such end,

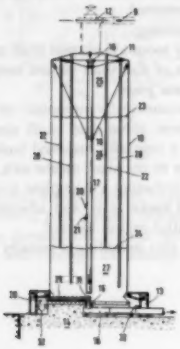
whereby feed slurry supplied to said separator feed slurry reservoir is filtered by passage of liquid therefrom through said basket vane commencing adjacent to the inner end of the vane and continuing substantially for the full length of the vane, while solids therefrom are retained on the vane surface for discharge therefrom separately from the filtrate upon rotation of said carrier about said axis of the shaft means at a relatively high rate imparting centrifugal force to said slurry and rotation of said basket about the basket axis at a relatively low rate,

and means for conducting said stream remainder from said concentrator discharge point to said separator feed slurry reservoir.

4,451,372
METHOD AND INSTALLATION FOR PURIFYING CONTAMINATING WATER

Felipe P. Rovira, Soria, Spain, assignor to D. Felipe Pineda S.A., Soria, Spain

Filed Sep. 23, 1981, Ser. No. 304,995
Claims priority, application Spain, Sep. 23, 1980, 495.266
Int. Cl.³ C02F 3/30; C05F 7/00
U.S. Cl. 210—603 14 Claims



1. A method of purifying gaseous or liquid or pasty waste, the method comprising the steps of: conveying the waste through a biological filter comprising a filter substrate including solids based on material of organic origin and in various stages of accelerated fermentation, the fermentation being caused by micro-organisms of at least one species resistant to the waste to be treated and capable of decomposing the waste and the filter substrate into harmless solid, gaseous, and liquid products; the filter substrate comprising vertically arranged first, second and third fermentation regions; there being aerobic fermentation in the first and third regions and anaerobic fermentation in the second region; the second region is located between the first and third regions; controlling the fermentation by introducing an oxygen-containing gas into the first and third regions and extracting at least one gas and at least one liquids from the second region so as to maintain the extent of each region and to maintain the temperature and moisture conditions within limits suitable for the process; and extracting decomposed material and harmless solids from the third fermentation region and introducing new filter material to the first fermentation region so that the filter substrate material is renewed by progressive conveyance through the fermentation regions, the renewal rate being such as to ensure complete decomposition of the waste and to maintain survival conditions for the micro-organisms in the three fermentation steps in the filter substrate.

4,451,373
RING CHANNEL AERATION APPARATUS AND METHOD

Paul M. Thayer, Shorewood, Wis., assignor to Water Pollution Control Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 140,533, Apr. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 62,880, Aug. 1, 1978, abandoned. This application Oct. 19, 1981, Ser. No. 312,462
Int. Cl.³ C02F 3/12
U.S. Cl. 210—626 133 Claims

133. A method of aerating wastewater with flexible allocation of horsepower consumption between circulation and aeration, said method comprising:

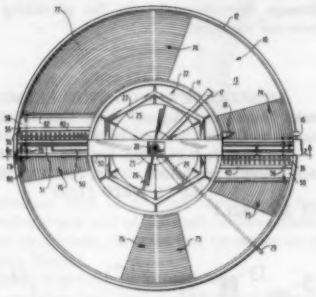
inducing circulation of wastewater in a loop channel along a horizontal flow path at a circulation rate which averages less than about one foot per second over the transverse cross-section of said channel,

by discharging gas into said wastewater through gas discharge means for causing upward and forward motion of the wastewater as it passes through and exits at least one propulsion zone, said zone or zones,

being located in and extending transversely of said flow path, and

occupying a minor portion of the length of said flow path;

bubbling oxidative process gas into the wastewater along said flow path outside said propulsion zone(s) through



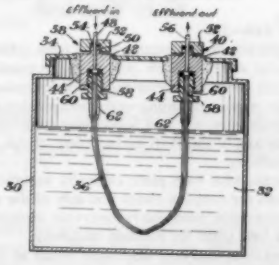
horizontally non-propulsive bubble release means having an oxygen transfer efficiency of at least about six;

applying about 0.5 to about 5 adiabatic horsepower per million gallons of daily plant throughput for inducing said circulation, while varying the rate of release of oxidative process gas in response to the BOD of the wastewater and independently of the rate of discharge through said gas discharge means, and maintaining the ratio of said horsepower relative to the total of said horsepower plus the adiabatic horsepower consumed in non-propulsive bubbling of process gas in the wastewater in the range of about 0.01 to about 0.35.

4,451,374
LIQUID CHROMATOGRAPHIC METHOD AND POST-COLUMN EFFLUENT TREATMENT FOR DETECTION AND SEPARATION AT OPTIMIZED PH

Dennis P. Peterson, Midland, and James C. Davis, East Lansing, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 274,127, Jun. 16, 1981, abandoned, which is a continuation of Ser. No. 183,526, Sep. 2, 1980, abandoned. This application Feb. 14, 1983, Ser. No. 465,976
Int. Cl.³ B01D 15/08
U.S. Cl. 210—656 8 Claims



5. Method of analyzing samples by liquid chromatography comprising adding sample to a silica based chromatographic

column means, adding eluent to the chromatographic column means effective to chromatographically displace species of the sample from the chromatographic column means, whereby chromatographically displaced sample species appear ultimately in the effluent of the chromatographic column means, the eluent being at a pH in the range nondetrimental to the silica chromatographic column means, the improvement which comprises feeding the effluent of the chromatographic column means through the internal bore of a hollow fiber membrane, ultimately to a liquid chromatographic detector, and prior to detection, using the hollow fiber membrane for permeation transfer of a mobile reagent into the effluent of the chromatographic column means to enhance the sensitivity of detection of the method by effecting a pH change in the effluent.

4,451,375

IODINE ADSORPTION VIA PICOLYLAMINE ION EXCHANGE RESINS

Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1983, Ser. No. 526,303
Int. Cl.³ B01J *41/04*
U.S. Cl. 210—670 **4 Claims**

1. A method of extracting iodide ions from an aqueous medium comprising:

(a) contacting an acidic aqueous medium containing iodide ions with a polymer bearing a plurality of moieties each containing at least one picolylamine group;

(b) separating the polymer from the aqueous medium; and

(c) contacting the polymer with a base so as to elute iodide adsorbed by the polymer.

4,451,376

MULTI-FUNCTIONAL HYPOBROMIDE PRECURSORS

John D. Sharp, Brookfield, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 28, 1983, Ser. No. 518,181
Int. Cl.³ C02F *1/50*
U.S. Cl. 210—701 **3 Claims**

1. An improved method for treating alkaline industrial process waters to control the growth and deposit of microorganisms which comprises adding to such waters a combination of a water-soluble anionic polymeric dispersant having a molecular weight not greater than 50,000 and hypobromous acid, said hypobromous acid having been produced by contacting a solution containing both:

(a) a water-soluble inorganic bromide, and

(b) an anionic polymeric dispersant

with a second solution of a chlorine containing oxidant chosen from the group consisting of an inorganic hypochlorite salt, hypochlorous acid, and chlorine.

4,451,377

PROCESS FOR CLEANING AN OIL-CONTAMINATED BRINE CONTAINING PARTICULATE DRILL CUTTING SOLIDS

S. Roy Luxemburg, 10530-424 Florida Blvd., Baton Rouge, La. 70815

Filed Feb. 5, 1982, Ser. No. 346,202
Int. Cl.³ B01D *21/01*
U.S. Cl. 210—708 **6 Claims**

1. A process for cleaning an oil-contaminated brine containing particulate drill cutting solids, said brine being selected from the group consisting of completion fluids and packer fluids which comprises

admixing together said oil-contaminated brine, and an aqueous solution containing a sufficient amount of a water soluble polymer selected from the group consisting of polyacrylamides, poly (acrylic acid), poly (ethylene oxide) resins, polyvinyl alcohol, carboxymethylcellulose, carrageenan gums, and guar gums, and a filter aid capable of forming an oil-free filtercake containing said particulate drill cutting solids, to demulsify the oil of said brine, and filtering said particulate drill cutting solids from the admixture and forming said oil-free filtercake while passing the oil through the filter with the brine, separating the oil and brine into a floating oil layer and a lower clear oil-free brine, and then removing said oil layer from said brine.

4,451,378

ISOLATION OF 3-ISOPROPYL-2,1,3-BENZOTHIADIAZIN-4-ONE-2,2-DIOXIDE FROM WASTE WATER FROM ITS PREPARATION

Hanspeter Hansen; Hans Merkle, and Albrecht Mueller, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,369
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 3141428
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—725 **1 Claim**

1. A process for isolating 3-isopropyl-2,1,3-benzothiadizin-4-one-2,2-dioxide (bentazone) from waste water containing bentazone which comprises:

(a) adjusting the pH of said waste water to a pH in the range of 7.5 to 9.5 and adding about 0.2 to 0.5% by volume, based on the waste water, of about a 40 to 60% by weight aqueous solution of an alkali metal salt or ammonium salt of bentazone;

(b) heating the mixture for about 15 to 30 minutes, at a temperature in the range of 75° to 115° C.;

(c) cooling said mixture to a temperature in the range of 5° to 30° C.; and

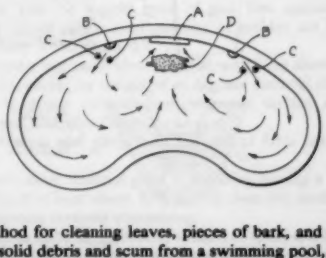
(d) adjusting the pH of the cooled mixture to a pH in the range of 1 to 3 with a mineral acid, to precipitate the bentazone in a free form, thereby allowing the filtration of said precipitate.

4,451,379

METHOD FOR CLEANING THE SURFACE OF SWIMMING POOLS

Richard Levy, P.O. Box 6313, Ft. Myers, Fla. 33906

Continuation-in-part of Ser. No. 297,001, Aug. 27, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 498,684
Int. Cl.³ C02F *1/52, 1/54*
U.S. Cl. 210—728 **12 Claims**



1. A method for cleaning leaves, pieces of bark, and other solid, semi-solid debris and scum from a swimming pool, filled with water comprising forming on the surface of the water in the pool an approximately monomolecular film of a nonionic autophobic liquid organic material having an HLB number of 10 or less, a boiling point of 170° C. or higher, bulk viscosity less than 1000 centistokes under conditions or use by applying the organic material at a level of 2–20 $\mu l/m^2$ of water surface, which monomolecular film pushes the surface scum and debris to a preselected region of the pool of water and compacts the suurface scum and debris, and removing the thus-compacted surface scum and debris with a compacted scum and debris

removal device positioned at a remote end of the pool from where said autophobic material is place in said pool.

4,451,380

WASTE DISPOSAL

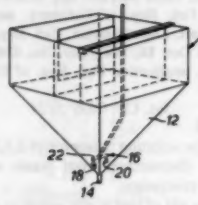
Derek W. Spence, 1 Saltaire Rd., Eldwick, Bingley, West Yorkshire, England

Filed Dec. 3, 1981, Ser. No. 327,224

Claims priority, application United Kingdom, Dec. 6, 1980, 8039183

Int. Cl.³ B01D *21/24*

U.S. Cl. 210—739 **9 Claims**



1. An apparatus for separating heavy solids from an effluent which comprises a tank and a solids discharge outlet communicating therewith, an ultra-sonic sensor located at a predetermined distance from the outlet, and means responsive to the output of the sensor for opening the discharge outlet when the solids concentration exceeds a present limit, the sensor being shielded from aggregates of solids falling through the effluent.

4,451,381

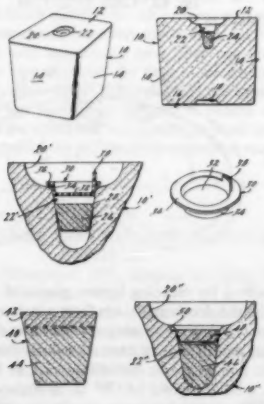
COMPOSITE PLUG FOR STAKE-HOLE OF SALT BLOCKS, SALT BLOCK PRODUCT, AND METHOD OF USING SAME

John F. Heiss, St. Clair, and Richard Kolasinski, Richmond, both of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Jul. 26, 1982, Ser. No. 402,096

Int. Cl.³ B65D *85/84*; B32B *9/04*

U.S. Cl. 252—1 **19 Claims**



1. A salt block suitable for use in forming a brine for regenerating and rejuvenating water conditioning ion exchange beds comprising an integral mass of salt in the form of a three dimensional block, a stake hole extending inwardly of one surface of said block into the interior thereof, and a mass of a water soluble rejuvenating agent disposed in said stake hole and positioned inwardly of said one surface.

15. A plug suitable for insertion in an aperture formed in an integral mass of salt for regenerating and rejuvenating water conditioning ion exchange beds comprising a composite mass including a first portion comprised of a water soluble material and a second portion integrally attached to said first portion comprised of a water soluble rejuvenating agent.

19. A method for generating a brine suitable for regenerating and rejuvenating water conditioning ion exchange resins which comprises the steps of providing an integral mass of salt in the form of a three-dimensional block having a stake hole extending inwardly of one surface thereof in which a mass of a water soluble rejuvenating agent is disposed, and contacting said block and said rejuvenating agent with an aqueous liquid to effect dissolution of said salt and said rejuvenating agent to form a brine.

4,451,382

SEWING THREAD LUBRICANTS

John T. Childers, Matthews, N.C., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Jun. 27, 1983, Ser. No. 508,445

Int. Cl.³ D06M *3/38, 13/00*

U.S. Cl. 252—8.6 **14 Claims**

1. A sewing thread lubricant composition comprising:

(a) from about 10 parts to about 60 parts by weight of a hardened coconut oil having a melt point of greater than 25° C.;

(b) from about 10 parts to about 60 parts by weight of a member selected from the group consisting of hydrogenated castor oil and hydrogenated tallow oil and mixtures thereof, said member having a melt point of greater than 30° C.; and

(c) from about 0 parts to about 60 parts by weight of a normally solid paraffin wax.

4,451,383

RECYCLABLE HOT PAD

Gustaf O. Arrhenius, La Jolla, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 866,695, Jan. 3, 1978, Pat. No. 4,331,556. This application Sep. 13, 1979, Ser. No. 74,955

Int. Cl.³ C09K *5/06*; F24J *3/04*

U.S. Cl. 252—70 **4 Claims**

1. In a method of providing for the formation of crystallites or crystal aggregates of a controlled size and of generating heat at a controlled temperature as a result of the formation of the crystallites or crystal aggregates,

providing a melt from sodium thiosulfate pentahydrate with properties of crystallizing in a particular melting temperature interval into a monolithic aggregate,

providing a liquid additive material selected from the group consisting of monohydric alcohols, diols and triols and having properties of absorbing on the surface of the crystals and being occluded in the crystals to control the size of the crystallites ultimately produced where the liquid additive material has a weight to approximately ten percent (10%) of the weight of the melt,

mixing the melt and the liquid additive material in a percentage of the liquid additive material of approximately ten percent (10%) by weight in the mixture to maintain the temperature of crystallization of the mixture at approximately 104° F. and to inhibit the spontaneous crystallization of the mixture at ambient temperatures approaching the particular melting temperature interval,

heating the mixture to a temperature at least equal to the melting temperature interval for a sufficient period of time to convert the melt into a liquid form, and

cooling the mixture to a temperature below the melting temperature interval.

3. In a method of providing for the formation of crystallites or crystal aggregates of a controlled size and generating heat,

providing sodium thiosulphate pentahydrate having properties of crystallizing into a monolithic mass when nucleated and having properties of providing such crystallization in a melting temperature interval,

providing a liquid additive material selected from a group consisting of a monohydric alcohol, diol or triol and having properties of occlusion in the growing crystals and exsolving to separate the growing crystals and limit their size,

providing a surface active material selected from a group consisting of sulfates, phosphates, phosphonates and sulfonates and having properties of reducing the surface tension of the liquid additive material on the growing crystals,

mixing the melt, the liquid additive material in a weight to approximately ten percent (10%) by weight of the mixture and the surface active material in a weight to approximately five percent (5%) by weight of the mixture, and

heating the mixture to a temperature at least equal to the melting temperature interval for a sufficient period of time to convert the mixture to the liquid state, and

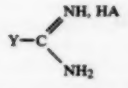
cooling the mixture to a temperature below the melting temperature interval without nucleating the melt in the mixture.

4,451,384
HALOFORMAMIDINES BLEACHING AGENT ACTIVATOR FUNCTIONING TO RELEASE ACTIVE OXYGEN

Jean Malafosse, Sassenage, France, assignor to L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 7, 1981, Ser. No. 309,503
Claims priority, application France, Oct. 24, 1980, 80 22754
Int. Cl.³ C11D *3/26, 7/54*
U.S. Cl. 252—102 **13 Claims**

4. Stable solid bleaching composition made up by the association of a water-soluble powdery solid derivative releasing hydrogen peroxide in an alkaline aqueous solution and an amidine activator functional at regular or moderate temperature to release active oxygen, said amidine activator being selected from the formula:



wherein Y is halogen, HA being an inorganic acid, said amidine activator being present in sufficient amount to activate the release of hydrogen peroxide at regular or moderate temperature.

8. Stable solid bleaching composition according to claim 4 wherein it further contains detergents.

4,451,385
AGENT FOR REDUCING DETERGENT IRRITATION TO SKIN AND EYES

Edward A. Tavss, Kendall Park; Edward Eigen, East Brunswick, and Kenneth F. Clark, Hazlet, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,917
Int. Cl.³ C07G *7/00*; C08H *1/06*
U.S. Cl. 252—132 **10 Claims**

1. A water-soluble, partially hydrolyzed protein fraction having an isoionic point greater than 7, a Bloom gel value of zero and a molecular weight of about 600 to 12,000, obtained by extraction from a partially hydrolyzed protein mixture and isolation by ion exchange treatment with an anion exchange resin using an optimum weight ratio of resin to partially hydrolyzed protein of approximately 20:1 followed by dialysis.

2. A substantially non-irritating, liquid, detergent composition comprising an aqueous vehicle containing 10% to 50% by weight of a water-soluble, anionic surfactant and about 0.2–5% by weight of a partially hydrolyzed, protein fraction having an isoionic point greater than 7, a Bloom gel value of zero and a molecular weight of about 600 to 12,000 obtained by extraction from a partially hydrolyzed protein mixture and isolation by ion exchange treatment with an anion exchange resin followed by dialysis.

4,451,386
DETERGENT TABLET

David P. Joshi, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 747,585, Dec. 6, 1976, Pat. No. 4,370,250. This application Sep. 29, 1982, Ser. No. 427,987
Int. Cl.³ C11D *3/075, 3/08, 11/02, 17/00*
U.S. Cl. 252—135 **21 Claims**

1. A cleaning tablet comprising a detergent composition produced by:

(a) hydrating a first quantity of anhydrous phosphate builder salt to the maximum in the presence of an alkali metal silicate using sufficient water to form a hydrated slurry;

(b) adding a second quantity of anhydrous phosphate builder salt to said hydrated slurry to form a crutcher mix;

(c) spray drying said crutcher mix to form a particulate material, the weight ratio of said first quantity of builder salt to said alkali metal silicate being from about 1.5 to about 5 and the weight ratio of said first quantity of builder salt to said second quantity of builder salt being from about 0.3 to about 0.7;

(d) combining said particulate material with from about 2 to about 40 percent by weight of an organic material chosen from the group consisting of, nonionic surface active agents and mixtures thereof;

(e) compressing said particulate material to form coherent tablets

said particulate material prior to tableting having a flowability of at least about 70% that of clean dry sand, said particulate material comprising:

from about 60 to 88 percent by weight of spray dried base beads having detergent building properties, comprising from about 45 to about 85% bt weight of an alkali metal phosphate wherein from about 30 to about 60 percent of the phosphate is hydrated and the remainder is anhydrous, from about 5 to about 15 percent by weight of a sodium silicate having an $Na_2O:SiO_2$ ratio of from about 1:1.6 to about 1:3.4 and from about 5 to about 15% water, wherein a portion of the water is present as water of hydration in the hydrated phosphate, the beads being essentially free of organic surfactant, organic detergent or soap, when spray dried;

from about 12 to about 40 percent by weight of a nonionic polyethoxylated synthetic organic detergent;

said beads having a structure of microcrystals and amorphous solid interconnected as an irregular network within the beads, the network defining interconnected irregularly shaped passageways, said passageways comprising a reticular void space within the beads and interconnecting to discrete openings on the external surface of the beads;

the nonionic detergent being applied to the external surfaces of the spray dried beads and being substantially absorbed into the internal passageways of the beads to produce the granular detergent;

the beads, before tableting, having a specific gravity of from about 0.5 to about 0.8;

at least 90% of the beads and the granular detergent having a particle size distributed between 20 mesh and 200 mesh U.S. sieve series, and

the beads, during tableting, being subjected to compression forces of between about ¼ ton to about 3 tons per square inch.

13. A method for producing cleaning tablets comprising hydrating a first quantity of anhydrous phosphate builder salt in the presence of a second quantity of alkali metal silicate to form a hydrated aqueous slurry; adding a third quantity of anhydrous phosphate builder salt to said hydrated slurry to form a crutcher mix; spray drying said crutcher mix to form a particulate material, the weight ratio of said first quantity to said second quantity being from about 1.5 to about 5, the weight ratio of said first quantity to said third quantity being from about 0.3 to about 0.7, combining said particulate with from about 2 to about 40 percent by weight of a liquid or liquifiable organic surface active agent to form detergent beads, compressing said material to form coherent tablets and wherein said hydrating step is performed at a temperature suitable for hydrating said first quantity of phosphate builder salt and said slurry is raised to a temperature that would inhibit hydration of said third quantity of phosphate builder salt.

4,451,387

SUDS CONTROL AGENTS AND DETERGENT COMPOSITIONS CONTAINING THEM

Loui H. T. Tai, Santes, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,398

Int. Cl.³ C11D *10/06*

U.S. Cl. 252—174.15 **6 Claims**

1. A detergent composition comprising an anionic surfactant and an effective amount of a suds control agent, characterized in that the sud control agent comprises:

(i) a core of gelatinized starch, in an amount from about 45 to 55%;

(ii) a silicon oil composition, in an amount from about 35 to 50%, sorbed thereon, the silicone oil composition being a mixture of silicone oil and hydrophobic silica; and

(iii) the silicone sorbed core coated with a wax in an amount of from about 7 to 15%;

the percentage being based on the total weight of the agent.

4,451,388

PREPARATION OF ALUMINUM OXIDE COATED SILICA SOLS USING ULTRAFILTRATION

Charles C. Payne, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 2, 1981, Ser. No. 317,041

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—313 S **5 Claims**

1. A method of producing alumina coated silica sols which comprises:

A. Mixing a concentrated deionized silica sol with a concentrated solution of trivalent acidic aluminum salts to obtain a premix,

B. Heating this premix to at least 90° C. for from 1 to 15 minutes to form an alumina reacted silica sol solution,

C. Cooling this alumina reacted silica sol solution to at least 180° F. to form a cooled alumina reacted silica sol solution,

D. Diluting this cooled alumina reacted silica sol solution with deionized water to about 10 weight percent solids to form a diluted alumina reacted silica sol,

E. Exposing the diluted alumina reacted silica sol to ultrafiltration through a membrane having a molecular weight cutoff of about 30,000, and

F. Adding distilled or deionized water to the diluted alumina reacted silica sol during step E to wash dissolved salts from said diluted alumina reacted silica sol to form a dilute alumina coated silica sol having a pH from about 4–5 and a conductivity of from 2000–4000 micromhos, and

G. Concentrating this dilute alumina coated silica sol to at least 30 weight percent solids,

thereby obtaining said alumina coated silica sols.

4,451,389

AQUEOUS GELS

Elmer E. Clear, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 152,227, May 22, 1980, Pat. No. 4,321,968. This application Jan. 28, 1982, Ser. No. 343,641

Int. Cl.³ E21B *43/22, 43/26;* C09K *7/02*

U.S. Cl. 252—315.3 **12 Claims**

1. A gelled aqueous brine composition which comprises

(a) an aqueous brine solution having at least 1,000 ppm divalent cations,

(b) a water thickening amount of carboxymethylhydroxyethyl cellulose (CHMEC) characterized by a degree of substitution (DS) ranging from about 0.1 to about 1 and a molar substitution (MS) ranging from about 1 to about 4, and

(c) an amount of an alkaline earth metal hydroxide sufficient to cause gelation and form said gelled composition.

4,451,390

COMPOSITIONS FOR THE CONTROL OF UNWANTED FOAM AND THEIR USE

William T. Flannigan, Lancashire, England, assignor to Imperial Chemical Industries Inc., London, England

Filed Jun. 21, 1982, Ser. No. 390,772

Claims priority, application United Kingdom, Sep. 30, 1981, 8129520

Int. Cl.³ B01D *19/04*

U.S. Cl. 252—321 **6 Claims**

1. A composition for the control of unwanted foaming comprising in percent by weight:

(a) 20–60% Soya bean oil,

(b) 15–50% mineral oil,

(c) 1–10% finely divided silica,

(d) 5–25% unsubstituted fatty acid monoester of glycerol, and

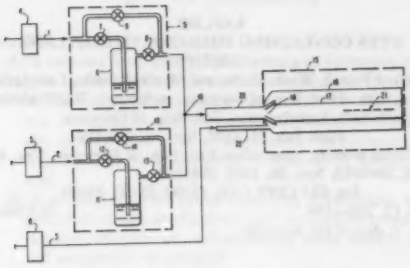
(e) 3–20% unsubstituted fatty acid ester of a polyoxyalkylated sorbitan.

5. A process for the control of unwanted foam which comprises incorporating a composition as claimed in claim 1 in the material generating the unwanted foam.

4,451,391
CONDUCTIVE SILICON CARBIDE

John C. Marinace, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,491
Int. Cl.³ H01B 1/06
U.S. Cl. 252—512 9 Claims



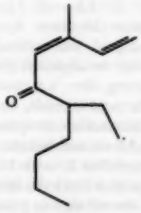
1. A body of electrically conductive material consisting only of silicon, carbon and the element germanium in a range between 0.01% and 0.03%.

4,451,392
SYNTHESIS OF TRICONJUGATED DIENONES AND NOVEL INTERMEDIATES USED IN SAID PROCESS

William J. Evers, Locust; Gilbert Stork, Englewood; Barja D. Mookherjee, Holmdel, and Howard H. Heinsohn, Jr., Freehold, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

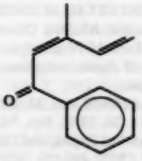
Filed Sep. 30, 1982, Ser. No. 431,268
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 4 Claims

1. The compound having the structure:



2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions and colognes, comprising the step of intimately admixing with said consumable material an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group of:

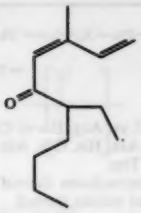
(i)



and

-continued

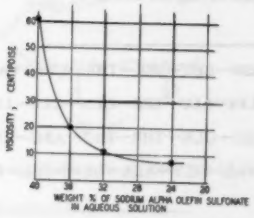
(ii)



4,451,393
CLEANER FOR OVENS AND THE LIKE USING SODIUM ALPHA OLEFIN SULFONATE, SODIUM HYDROXIDE, AND SODIUM SILICATE

Henry Watanabe, Vernon Hills, and Andrew Shultz, Deerfield, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.

Filed Aug. 11, 1982, Ser. No. 407,154
Int. Cl.³ C11D 1/14, 3/08, 11/00
U.S. Cl. 252—536 23 Claims



1. A homogeneous composition for oven cleaning and the like comprising on a 100 weight percent total composition basis:

(A) from about 2 to 36.8 weight percent of a sodium alpha olefin sulfonate derived from at least one alpha olefin containing from 12 to 18 carbon atoms per molecule,

(B) from about 0.1 to 1.9 weight percent of salt selected from the group consisting of sodium chloride and sodium sulfate,

(C) from about 1 to 12.5 weight percent of sodium hydroxide,

(D) from about 2.3 to 23.5 weight percent of sodium silicate having an SiO_2 to Na_2O weight ratio of 3.2:1 to 1:2, and

(E) from about 26 to 94 weight percent of water,

said composition being further characterized by

(1) having said components (A), (B), (C) and (D) each substantially completely dissolved in said water, and

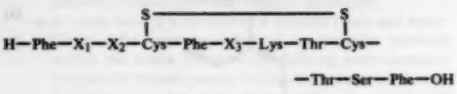
(2) having the sum of the respective weight percentages of each of said components (A), (B), (C) and (D) at least such that the viscosity of the resulting such composition is at least about 1000 centipoises as measured with a Brookfield viscometer using a #3 spindle at 60 revolutions per minute at about 24° C.

4,451,394
DODECAPEPTIDES PREVENTING GLUCOSE AND TRIGLYCERIDE ASSIMILATION

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,493
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 S 4 Claims

1. A compound of the formula:



where
X_1 is either D- or L- Lys, Arg, His or Orn;
X_2 is either D- or L- Asn, His, Glu, Asp, Tyr, Trp or Phe;
X_3 is either D- or L- Trp;
the linear precursor intermediates thereof and pharmaceutically acceptable salts and amides thereof.

4,451,395

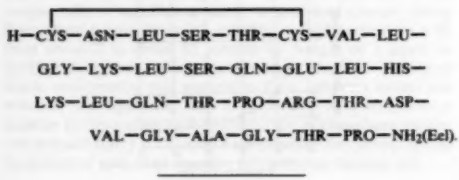
DES-SERINE^2-DES-TYROSINE^{22} CALCITONIN

Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,113
Int. Cl.^{3} C07C *103/52*
U.S. Cl. 260—112.5 T **4 Claims**

1. [Des-X^2-Des-Y^{22}] eel, bovine, porcine, ovine, rat, or human calcitonin wherein
X is serine or glycine, and
Y is phenylalanine or tyrosine.

2. A peptide having the structure:



4,451,396

PROCESS FOR INHIBITING UNDESIRED THIOL REACTIONS DURING CYANOGEN BROMIDE CLEAVAGE OF PEPTIDES

Richard D. Di Marchi, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 1, 1983, Ser. No. 519,169
Int. Cl.^{3} C07G *7/00*; C07C *103/52*; A61K *37/26*
U.S. Cl. 260—112 R **7 Claims**

1. A process for inhibiting undesired thiol reactions of thiol-containing peptides during methionyl cleavage of said peptides using CNBr, which comprises carrying out said cleavage in the presence of thiosulfate ion.

4,451,397

METHOD OF PREPARING COLLAGEN PRODUCTS

Alain R. Huc, Ste-Foy-les-Lyons; Roland L. Allard, Saint-Chamond, and Christian L. Chavrier, Caluire, all of France, assignors to Centre Technique du Cuir, Lyons, France

Filed Nov. 22, 1982, Ser. No. 443,759
Claims priority, application France, Nov. 30, 1981, 81 22691
Int. Cl.^{3} C07G *7/00*; C08H *1/00, 1/06*
U.S. Cl. 260—123.7 **6 Claims**

1. A method of preparing a collagen mucopolysaccharide composition in the form of a clear solution which comprises the steps of:
(a) contacting ground collagenous material with an alkali solution having a pH of 14 for a prolonged time period to form a collagenous mixture;
(b) acidifying the collagenous mixture formed during step (a) to a pH of 2 to form decrosslinked collagen in the form of a solution or gel; and
(c) combining the decrosslinked collagen in the form of a solution or gel with a solution of a glycosaminoglycan, and then bringing the pH of the combined solutions to 7 by addition of alkali, thereby producing the desired product.

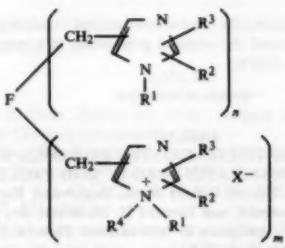
4,451,398

DYES CONTAINING IMIDAZOLYMETHYLENE GROUPS

Manfred Patsch, Wachenheim, and Manfred Ruske, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,479
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1980, 3006013; Nov. 26, 1980, 3044563
Int. Cl.^{3} C09B *1/00, 15/00, 25/00, 29/00*
U.S. Cl. 260—154 **10 Claims**

1. A dye of the formula:



where R^1 is hydrogen, C_1–C_6-alkyl or C_2–C_6-alkenyl, R^2 and R^3 independently of one another are hydrogen, C_1–C_5-alkyl or C_2–C_5-alkenyl, R^4 is C_1–C_{12}-alkyl or hydroxy-C_2–C_4-alkyl, X^- is one equivalent of an anion, F is an (m+n)-valent radical of a monoazo dye, a polyazo dye, a quinophthalone, a bis-dioxazine, a compound of the 5,6-arylo-2-pyrone series, a naphtholactam dye, a triphenylmethane dye, a xanthene dye, a phthalocyanine, an indigoid, and anthraquinone dye containing one or more phenyl or naphthyl groups, a more highly fused carbonyl-containing dye, a quinacridone, a perylene-3,4,9,10-tetracarboxylic acid diimide, an anthrapyrimidine, a pyrazoloanthrone, a diaminonaphthoquinone, a naphthazarine or a naphthalene-1,4,5,8-tetracarboxylic acid diimide, m is from 0 to 5 and n is from 0 to 5, with $1 \leqq (m+n) \leqq 5$, wherein the methylene group which links the imidazole radical to the dye F being attached on one side to a carbon atom of an aromatic ring of dye F and on the other side to one of the three carbon atoms of the imidazole ring.

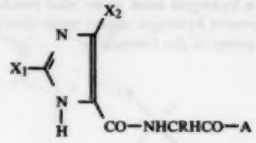
4,451,399

IMIDAZOLECARBOXYLIC ACID DERIVATIVES

Naohiko Yasuda, Yokosuka; Masaru Okutsu, Yamato; Hisao Iwagami, Kawasaki; Teruaki Nakamiya, Tokyo, and Ichiro Takase, Kawasaki, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Continuation of Ser. No. 170,928, Jul. 21, 1980, abandoned. This application Nov. 30, 1982, Ser. No. 445,663
Claims priority, application Japan, Jul. 20, 1979, 54-92940
Int. Cl.^{3} C07D *499/70, 501/36*
U.S. Cl. 260—239.1 **10 Claims**

1. A compound having the formula (I):



(I)

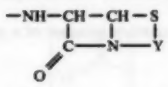
wherein

X_1 is selected from the group consisting of hydrogen, halogen, hydroxyl, alkyloxy, aralkyloxy, aryloxy, mercapto, alkylthio, aralkylthio, arylthio, alkylsulfonyl, aralkylsulfonyl, arylsulfonyl, alkylsulfinyl, aralkylsulfinyl, arylsulfinyl, amino, mono- or di-alkylamino, -aralkylamino or -arylamino, acylamino, sulfonyl, nitro, alkyl, aralkyl and aryl;

X_2 is selected from the group consisting of hydrogen, halogen, nitro, amino, acylamino, mono- or di-alkylcarbamoyl, -aralkylcarbamoyl or -arylcarbamoyl, alkyl, aralkyl, aryl, and morpholino-4-carbonyl;

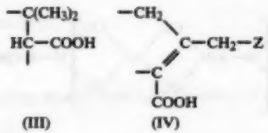
R is selected from the group consisting of hydrogen, alkyl, aralkyl, and aryl; and

A is an organic residue of the formula (II):



(II)

wherein Y is an organic residue having one of the following formulas (III) or (IV):



(III) (IV)

wherein

the carbon atom which combines with the COOH combines with nitrogen atom in Y, and

Z is selected from the group consisting of hydrogen, acyloxy, carbamoyloxy, 5-(1-methyltetrazolyl)-thio, 5-(1-(2-sulfoethyl)tetrazolyl)thio, 2-(1,3,4-thiadiazolyl)thio, and quaternary ammonium which may be unsubstituted or substituted by sulfoethyl or carboxymethyl,

or a pharmaceutically acceptable salt thereof.

4,451,400

PHOSPHAZENES USEFUL AS STABILIZERS IN POLYMERS

Hartmut Wiezer, Gerstbofen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,889

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118962

Int. Cl.³ C07D 251/70, 401/12

U.S. Cl. 260—244.4 **1 Claim**

1. A phosphazene, substituted by piperidyl groups, of the formula (I)

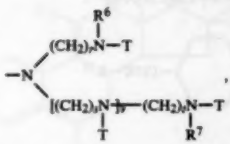
(I)

in which

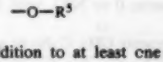
n is an integer from 3 to 100,

R^1 and R^2 are identical or different and represent a group of the formulae (II), (III), or (IV)

(II)



(III)

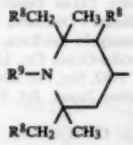


(IV)

or represent, in addition to at least one of these groups, halogen,

and in the formula (II)

R^3 and R^4 are identical or different and represent hydrogen, C_1- to C_{18}-alkyl, C_5- to C_{12}-cycloalkyl, phenyl, which can be substituted by Cl, CH_3O- or C_1- to C_4-alkyl, or C_7- to C_9-phenylalkyl or they denote a group of the formula (V)



(V)

in which

R^8 represents hydrogen or methyl and

R^9 represents hydrogen, C_1- to C_4-alkyl which can be substituted by up to two OH groups, 2,3-epoxypropyl, allyl or benzyl,

R^3 additionally represents C_3- to C_{21}-alkoxyalkyl or

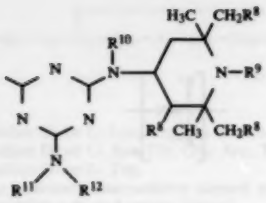
R^3 and R^4 together with the N atom linking them represent a pyrrolidine ring or a piperidine, morpholine or hexamethyleneimine ring which can also be substituted by up to 4 C_1- to C_4-alkyl groups,

and in the formula (III)

r, s and t are identical or different integers from 2 to 6, v represents an integer from 0 to 3, and

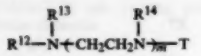
R^6 and R^7 represent identical or different radicals R^5 or represent a group of the formula (V) and

T has the meaning of a group of the formula (VI)

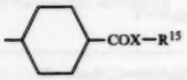


(VI)

in which
R^8 and R^9 have the meanings indicated above,
R^{10} and R^{11} are identical or different radicals having the meaning of R^3 and
R^{12} is a radical having the meaning of R^4,
and in the formula (IV)
R^5 represents a radical R^4 or a group of the formula (VII) or (VIII),



(VII)



(VIII)

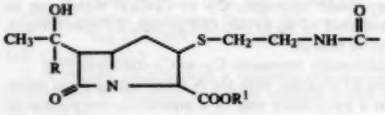
in which
X represents 0 or NR^3, with R^3 as indicated above and
R^{15} represents CH_3, C_2H_5 or a group of the formula (V),
m is 0 or 1,
T is a radical of the formula (VI),
R^{12} is C_2- to C_6-alkylene,
R^{13} is a radical R^4 or T and
R^{14} is a radical R^4 and the formula (I) must contain at least one group of the formula (V).

4,451,401
ANTIBIOTICS AND PROCESS FOR PRODUCTION THEREOF

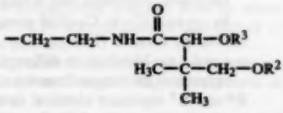
Mitsuyasu Okabe, Fujisawa; Takeo Yoshioka, Ayase; Yasuo Fukagawa, Kamakura; Rokuro Okamoto, Fujisawa; Kageaki Kouno, Tokyo, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,166
Claims priority, application Japan, Jul. 1, 1981, 56-101162; Feb. 4, 1982, 57-15490
Int. Cl.³ C07D *487/04*
U.S. Cl. 260—245.2 T **7 Claims**

1. A compound represented by the following formula



(I)



wherein
R represents a hydrogen atom or a methyl group,
R^1 represents a hydrogen atom or an ester residue, and
R^2 and R^3 represent hydrogen atoms respectively, or taken together, a group of the formula

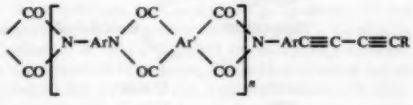
in which each of R^4 and R^5 represents a hydrogen atom, a lower alkyl group or a phenyl group,
or its salt.

4,451,402
ADDITION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYIMIDE WITH A DIARYL CONJUGATED BUTADIYNE

Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,614, Dec. 29, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,869
Int. Cl.³ C07D *209/34, 471/00;* C08F *22/40*
U.S. Cl. 548—461 **23 Claims**

1. The Diels-Alder addition product of a polyimide of the formula:



wherein:
Ar' is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar' except in the case of Ar' being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;
Ar is a divalent aromatic radical;
n is zero or an integer having a value of one to 20; and
R is hydrogen or an organic moiety containing 1 to 21 carbon atoms;
and a dienophile of the formula:

$$Ar^{\circ}—C{\equiv}C—C{\equiv}C—Ar^{\circ}$$

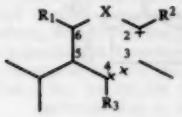
wherein Ar° is a monovalent aromatic radical.

4,451,403
SUBSTITUTED METHYL ISOPROPYL OXOCYCLOHEXANE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

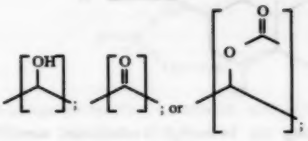
Philip T. Klemarczyk, Old Bridge, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 343,571
Int. Cl.³ C07C *50/02, 35/18;* A61K *1/46;* C07C *69/025*
U.S. Cl. 260—396 N **3 Claims**

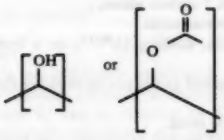
1. A substituted methyl isopropyl oxocyclohexane derivative defined according to the structure:



wherein at least one of the lines [++++] is a carbon-carbon single bond and the other of the lines [++++] is a carbon-carbon single bond or a carbon-carbon double bond; wherein X represents the moiety:



wherein when the moiety X has the structure:



then one of the lines:

[++++]

is a carbon-carbon double bond and the other of the lines:

[++++]

is a carbon-carbon single bond and when the moiety X has the structure:

then both of the lines:

[++++]

represent carbon-carbon single bonds; wherein one of R_1, R_2 or R_3 is 2-methyl-1-propenyl or 2-methyl-1-propylidenyl; and the other of R_1, R_2 or R_3 is hydrogen; with the provisos that:

(i) when the line:

[++++]

at the 3-4 position represents a carbon-carbon double bond R_3 is hydrogen or 2-methyl-1-propenyl; and

(ii) when the line;

[++++]

at the 2-3 position is a carbon-carbon double bond, R_2 is hydrogen or 2-methyl-1-propenyl.

4,451,404

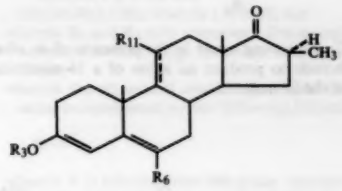
16β-METHYL STEROID PROCESS

Verlan H. Van Rheenen, Portage, and Joseph M. Timko, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

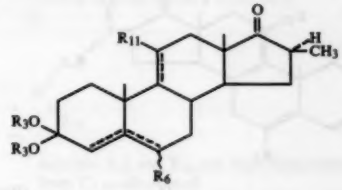
Filed Feb. 9, 1983, Ser. No. 465,141
Int. Cl.³ C07J 1/00, 9/00
U.S. Cl. 260—397.45 26 Claims

1. A process for the preparation of 16β-methyl-17-keto steroids selected from the group consisting of

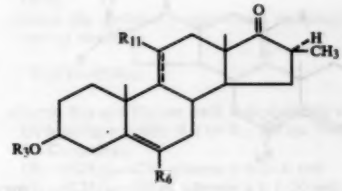
(IVAa)



(IVAb)



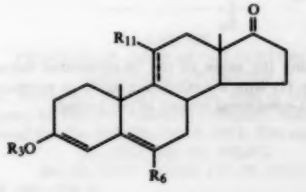
(IVCa)



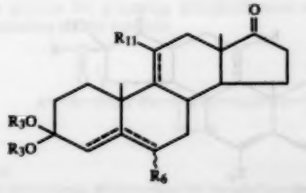
which comprises

(1) contacting a 17-keto steroid selected from the group consisting of

(IAa)

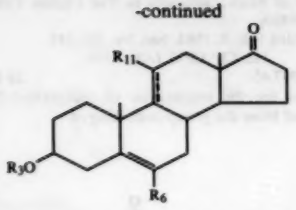


(IAb)



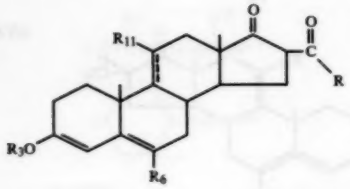
-continued

(ICa)

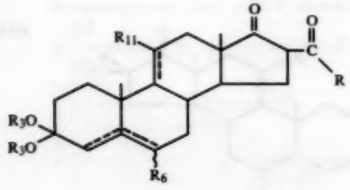


with a C_{16} activating agent in the presence of an alkali metal alkoxide to produce an anion of a 16-substituted steroid of the formula

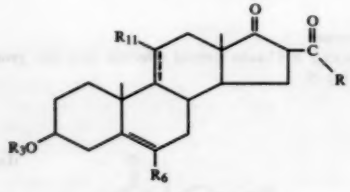
(IIAa)



(IIAb)

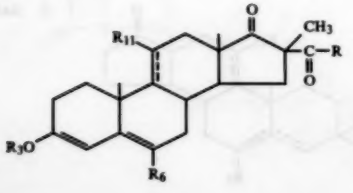


(IICa)



(2) contacting the anion of the 16-substituted steroid (II) from step (1) with a methylating agent to produce a 16-methyl-16-substituted steroid of the formula

(IIIAa)



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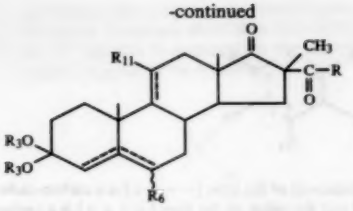
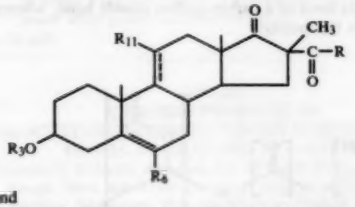
(IIIAb)



(IIICa)



and

(3) contacting the 16-methyl-16-substituted steroid (III) from step (2) with a strong base in an alcohol containing solvent where

R is a hydrogen atom or —CO—OR′ or —OR′;

R′ is alkyl of 1 through 5 carbon atoms;

R_3 is alkyl of 1 through 5 carbon atoms;

R_6 is a hydrogen or fluorine atom,

R_{11} is a hydrogen atom, nothing ($\Delta^{9(11)}$), or a hydroxyl group (α or β);

~indicates that the attached group can be in either the α or β configuration; and

is a single or double bond.

25. 3-Methoxy-16-methyl-16-(methyloxalyl)androst-3,5,9(11)-trien-17-one.

4,451,405

11α-AMINO-3β-HYDROXY-ANDROSTANES

Gordon H. Phillipps, Wembley; David C. Humber, Ealing; David B. Ewan, Northolt, and Barry A. Coomber, Pinner, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 353,068, Mar. 1, 1982. This application Dec. 6, 1982, Ser. No. 447,190

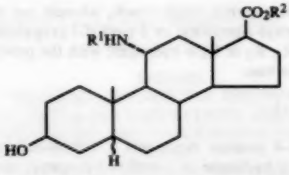
Claims priority, application United Kingdom, Mar. 2, 1981, 8106486

Int. Cl.³ A61K *31/56*

U.S. Cl. 260—397.1 **13 Claims**

1. Compounds of the formula

(I)



wherein R^1 is a C_{1-4} alkyl group or a C_{3-7} cycloalkyl group and R^2 is a C_{1-6} alkyl group or a C_{3-6} cycloalkyl group and the D-homo analogues thereof having the group $—CO_2R^2$ (wherein R^2 is as defined above) at the 17αβ-position, and acid addition salts thereof.

4,451,406

N-SUBSTITUTED IMIDO-DICARBOXYLIC ACID DIARYL ESTER METHOD OF PREPARATION

Karlfried Dickoré, Leverkusen, and Engelbert Kühle, Berg.-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

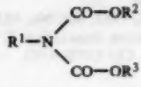
Continuation of Ser. No. 350,057, Feb. 18, 1982, which is a division of Ser. No. 233,248, Feb. 10, 1981, abandoned. This application Aug. 5, 1983, Ser. No. 520,704

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006226

Int. Cl.³ C07C *125/067*

U.S. Cl. 260—465 D 13 Claims

1. Process for the production of N-substituted imido-dicarboxylic acid diaryl ester compound of the formula



(I)

which comprises reacting a carbamic acid aryl ester of the formula:

(II)

with a carbonic acid aryl ester halide of the formula

(III)

wherein

R^1 is an optionally substituted aliphatic, cycloaliphatic, araliphatic, aromatic or heterocyclic radical; and

R^2 and R^3 can be identical or different and represent an optionally substituted aryl radical; and

X is a halogen; in the absence of an acid-binding agent, at temperatures ranging from about 170° C. to about 250° C.

4,451,407

CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

Frederick A. Pesa, Aurora, and Thomas A. Haase, University Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

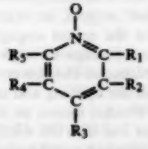
Continuation of Ser. No. 170,308, Jul. 16, 1980, Pat. No. 4,331,612, which is a continuation-in-part of Ser. No. 973,069, Dec. 28, 1978, abandoned. This application Dec. 18, 1981, Ser. No. 332,059

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ C07C *120/00, 121/16*

U.S. Cl. 260—465.4 21 Claims

1. A process for the production of an oxygenated organic compound containing a nitrogen moiety wherein the straight chain product predominates comprising contacting an olefinically unsaturated compound in the liquid phase with carbon monoxide and a compound containing a replaceable hydrogen atom at a temperature of about 50° C. to about 150° C. in the presence of a catalyst comprising at least one of cobalt carbonyl and ruthenium carbonyl and a promoter ligand represented by the following structure:



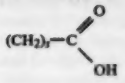
wherein R_1, R_2, R_3, R_4, and R_5 are each independently selected from the group consisting of:

(1) H;

(2) $C_{1\text{-}10}$ alkyls;

(3) $(CH_2)_q$ OH wherein q is 0–10;

(4)



wherein s is 0–10; and

(5) $O(CH_2)_t CH_3$ wherein t is 0–10; and

wherein R_1 and R_2 may comprise a five to eight membered carbocyclic fused ring optionally substituted with $C_{1\text{-}10}$ alkyls;

wherein the compound containing a replaceable hydrogen atom is represented by the following formula:

wherein Y is selected from the group consisting of:

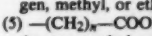
(1) OR_{14} wherein R_{14} is a $C_{1\text{-}30}$ alkyl;

(2)

wherein R_{15} and R_{16} are each independently selected from $C_{1\text{-}10}$ alkyls; and

(3) H;

wherein the olefinically unsaturated compound has the following structure:



wherein R_{11} and R_{12} are each independently selected from:

(1) hydrogen (either R_{11} or R_{12} but not both);

(2) $C_{1\text{-}30}$ alkyl;

(3) $-(CH_2)_p-CN$, wherein p is 0–3: and

(4) $-(CH_2)_q-OR_{13}$, wherein q is 1–30 and R_{13} is hydrogen, methyl, or ethyl; and

(5) $-(CH_2)_n-COOR_{17}$, wherein n is 0.5 and R_{17} is hydrogen, methyl or ethyl, with the proviso that at least one of R_{11} and R_{12} contains a nitrile moiety; and,

wherein the molar ration of the compound containing a replaceable hydrogen atom to the olefinically unsaturated compound is 0.5:1 to 100:1.

4,451,408

PROCESS OF PREPARING SULFONIUM ORGANOSULFONATES

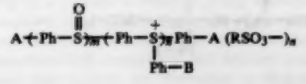
Gary R. Buske, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 346,691, Feb. 8, 1982. This application Dec. 27, 1982, Ser. No. 453,312

Int. Cl.³ C07C *143/02, 143/26, 143/28*

U.S. Cl. 260—505 R 15 Claims

1. A process for preparing triarylsulfonium complex salts corresponding to the formula:

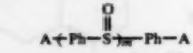


wherein

Ph is phenylene, diphenylene or oxydiphenylene;

A and B independently each occurrence are hydrogen, C_{1-4} alkyl, phenyl, C_{1-4} alkoxy or phenoxy;
R is lower alkyl, phenyl or tolyl;
m is an integer greater than or equal to zero, equal to the number of sulfoxide moieties in the complex salt; and
n is an integer greater than or equal to one, equal to the number of sulfonium moieties in the complex salt

comprising contacting a diarylsulfoxide or polymeric arylsulfoxide corresponding to the formula



with an aromatic compound of the formula B—Ph—H in the presence of an organosulfonic acid of the formula RSO_3H at elevated temperatures

wherein

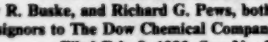
A, Ph, B and R are as previously defined; and
m′ is an integer greater than or equal to one, equal to the number of sulfoxide moieties in the compound.

4,451,409
SULFONIUM ORGANOSULFONATES

Gary R. Buske, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1982, Ser. No. 346,691
Int. Cl.³ C07C 147/14, 149/46
U.S. Cl. 260—513 R **9 Claims**

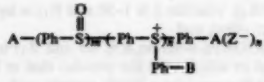
1. A triarylsulfonium complex salt corresponding to the formula:



wherein

Ph is phenylene;
A independently each occurrence is C_{1-4} alkyl or phenoxy;
PhB is phenoxyphenyl; and
Z^- is a counterion selected from the group consisting of RSO_3^-, BF_4^-, PF_6^-, AsF_6^- and SbF_6^- where R is lower alkyl, phenyl or tolyl.

5. A polymeric triarylsulfonium complex salt corresponding to the formula

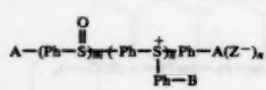


wherein

Ph is phenylene, diphenylene or oxydiphenylene;
Z^- is a counterion selected from the group consisting of RSO_3^-, BF_4^-, PF_6^-, AsF_6^- and SbF_6^- where R is lower alkyl, phenyl or tolyl;
A and B independently each occurrence are hydrogen, C_{1-4} alkyl, phenyl, alkoxy or phenoxy;
m is an integer greater than or equal to zero, equal to the number of sulfoxide moieties in the complex salt; and
n is an integer greater than or equal to one, equal to the number of sulfonium moieties in the complex salt;

provided that m+n is from about 2 to about 30 and the ratio of m/n is from about 95/5 to about 10/90.

8. A polymeric triarylsulfonium complex salt corresponding to the formula



wherein

Ph is oxydiphenylene;
Z^- is a counterion selected from the group consisting of RSO_3^-, BF_4^-, PF_6^-, AsF_6^- and SbF_6^- where R is lower alkyl, phenyl or tolyl;
A and B independently each occurrence are hydrogen, C_{1-4} alkyl, phenyl, alkoxy or phenoxy;
m is an integer greater than or equal to zero, equal to the number of sulfoxide moieties in the complex salt; and
n is an integer greater than or equal to one, equal to the number of sulfonium moieties in the complex salt;

provided that m+n is from about 2 to about 30.

4,451,410
PROCESS FOR PREPARING CONDENSED POLYALKOXYPHOSPHAZENE

Osamu Shibuta, Tokushima; Tetuo Hasegawa, and Jun Ogawa, both of Naruto, all of Japan, assignors to Otsuka Chemical Co., Ltd., Osaka, Japan

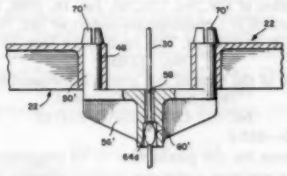
Filed Sep. 1, 1982, Ser. No. 413,686
Claims priority, application Japan, Sep. 5, 1981, 56-140127
Int. Cl.³ C07F 9/40
U.S. Cl. 260—973 **9 Claims**

1. A process for preparing a condensed polyalkoxyphosphazene which comprises the steps of (A) reacting a phosphonitrilic halide oligomer with an alcohol in a solvent in the presence of an alkali metal carbonate to produce a condensed partially alkoxy-substituted phosphazene having a residual active halogen concentration of 6 to 25% by weight, the phosphonitrilic halide oligomer being a cyclic oligomer, a linear oligomer or the mixture thereof, (B) removing water from the reaction mixture containing the condensed partially alkoxy-substituted phosphazene by distillation, and (C) reacting the condensed partially alkoxy-substituted phosphazene with an excess amount of an alkali metal alkoxide based on the residual active halogen of the condensed partially alkoxy-substituted phosphazene in a solvent at a temperature of 50° to 120° C.

4,451,411
SUPPORT MEANS FOR TRANSVERSE FILL FOR COOLING TOWERS

Marcel R. Lefevre, Somerville, N.J., assignor to Research-Cottrell, Somerville, N.J.

Filed Sep. 28, 1982, Ser. No. 426,062
Int. Cl.³ B01F 3/04
U.S. Cl. 261—111 **6 Claims**



1. In a liquid cooling tower construction consisting of a housing having a lower air inlet and an upper air outlet, an array of vertically stacked horizontally positioned fill sheets or grids within the housing between the lower air inlet and the upper air outlet, the improvement comprising means for supporting said array of fill sheets or grids in their vertically stacked arrangement, fill sheet or grid support bracket means having at least a pair of arms, each of the arms being provided with means engagable with a fill sheet or grid, an opening through each bracket means between the means engagable with a fill sheet or grid, each of the openings through the bracket means having at least one recess at the lower end thereof and a slot communicating with the opening and communicating with an outer wall of the bracket means, an elongate hanger member having a diameter less than the width of the slot in the bracket means and an enlarged member on the

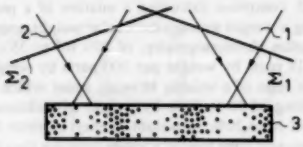
elongate hanger member receivable in the at least one recess in the bracket means.

4,451,412

PROCESS FOR PRODUCING DIFFRACTING PHASE STRUCTURES

Brigitte Loiseaux; Jean P. Huignard; Jean C. Dubois, and Armand Eranian, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 29, 1982, Ser. No. 428,162
Claims priority, application France, Jan. 12, 1982, 82 00371
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.3 **10 Claims**



1. A process for producing diffracting phase structures comprising a medium formed of microballs of dielectric material in suspension in a liquid, in which two light waves interfere, the said process comprising one stage during which these two light waves are made to interfere in the medium, thereby recording their interference network in the medium, and, the liquid being polymerizable, a second stage in which the medium is solidified by exposing it to energy radiation, thereby fixing the interference network in situ.

4,451,413

JACKETING STEEL TUBES AND PIPES

Walter Stucke, Ratingen, and Karl-Heinz Glissmann, Essen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,134
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3047429
Int. Cl.³ B29H *5/26*
U.S. Cl. 264—26 **4 Claims**

1. A method of jacketing a steel pipe by means of a dual nozzle extruding device, wherein an inner hose is extruded of a granulated ethylene copolymer to act as an adhesive, and an outer hose of a thermoplastic is extruded as the jacket proper, the improvement comprising said copolymer including acrylic acid and acrylic acid ester

pre-drying the copolymer in air having a dew point below −30° C. at a temperature of about 70° C. and for approximately one hour

the thermoplastic and the copolymer, being extruded at the same speed at a temperature between 140° C. and 170° C., the speed being selected to be the higher, the higher the temperature of the thermoplastic and the copolymer in the dual nozzle head, accordingly the speed being at least 5 cm/sec. for a 140° C. head temperature, and at least 10 cm/sec. for a 175° C. head temperature.

4,451,414

APPARATUS AND METHOD FOR CONTROLLING EXTRUSION BACK PRESSURE UTILIZING A SINGLE SLEEVE DIE

Paul H. Rossiter, Royersford, Pa., assignor to Welding Engineers, Inc., King of Prussia, Pa.

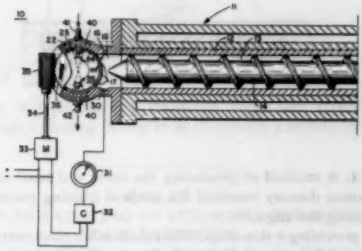
Filed Jun. 28, 1982, Ser. No. 393,051
Int. Cl.³ B29F *3/04*
U.S. Cl. 264—40.5 **4 Claims**

1. In a face cutting apparatus having an extrudate feed means with an extrudate delivery end, a die means and a cutter means, an apparatus for controlling extrusion back pressure comprising:

a. a die having a plurality of extrusion orifices through which an extrudate is adapted to be extruded and having a varying orifice density along the length of the die;

b. pressure sensing means for sensing the pressure adjacent said delivery end; and

c. means for moving said die relative to said delivery end in response to changes in the pressure adjacent said delivery end to align a die area of differing orifice density with said delivery end in order to adjust the extrudate flow rate and the extrusion back pressure.



4. A method for controlling extrusion back pressure, in a face cutting apparatus having an extrudate feed with an extrudate delivery end, a die and a cutter, comprising:

a. sensing the pressure adjacent said delivery end;

b. operatively positioning the die downstream from said delivery end, said die having a plurality of extrusion orifices through which an extrudate is adapted to be extruded, and having a varying orifice density along the length of the die; and

c. moving said die relative to said delivery end in response to changes in the pressure adjacent said delivery end to align a die area of differing orifice density with said delivery end in order to adjust the extrudate flow rate and the extrusion back pressure.

4,451,415

METHOD FOR MANUFACTURE OF FOAMED CERAMIC ARTICLE

Shoji Terada, Nagoya, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,778
Claims priority, application Japan, Jul. 16, 1981, 56-111261
Int. Cl.³ B29H *7/20*
U.S. Cl. 264—43 **9 Claims**

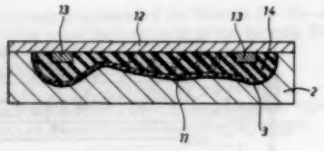
1. A method for the manufacture of a foamed ceramic article, adding to a powdered feldspar group mineral a foaming agent consisting of 0.1 to 10% by weight of powdered hexagonally crystalline boron nitride, sintering the resultant mixture at a temperature high enough for said feldspar group mineral to be fused and swelled, and thereafter cooling the sintered mixture, said feldspar group mineral being at least one member selected from the group consisting of orthoclase, soda feldspar, anorthite, and microcline.

4,451,416

METHOD OF PRODUCING A COMPOSITE FOAMED RESIN TORSO AND HEAD SECTION OF A HUMAN SUMMARY FOR MEDICAL TRAINING PURPOSES

Paul Bartscher, Dübendorf, Switzerland, assignor to Zurcher Kantonalbank, Zurich, Switzerland

Filed Aug. 10, 1981, Ser. No. 291,591
Claims priority, application Switzerland, Aug. 13, 1980, 6119/80
Int. Cl.³ B29D 27/04
U.S. Cl. 264—46.6 10 Claims



1. A method of producing the torso and head section of a human dummy intended for medical training purposes, comprising the steps of:

providing a skin-shaped hull made of an elastomeric material and corresponding to the human skin section covering the torso and head of a human body;

applying a rigidly setting pourable compound on to the inner surface of said skin-shaped elastomeric hull and permitting said rigidly setting compound to solidify to a rigid shell-like body;

removing said elastomeric hull from said soldified shell-like body;

forming a master model by cutting and machining said shell-like body so as to produce a model of the torso and skull sections of a human skeleton in which at least surface areas extending laterally to outer and inner surfaces of said rigid shell-like body have a contour which is similar to a contour of corresponding natural bone sections of said human skeleton, so that said master model has a form of at least the projection of the torso and skull sections of a human skeleton;

inserting said master model into said elastomeric skin-like hull, said master model keeping said skin-like hull in a spread open state such that it defines a void,

injecting an elastomerically setting pourable compound into said void defined by said elastomeric skin-like hull stretched over said master model and of letting said elastomerically setting compound solidify to an elastomerically yielding negative mold form of said master model;

removing said master model from said elastomerically yielding negative mold form;

inserting said negative mold form into said elastomeric hull to define a void space between said negative mold form and said elastomeric hull;

casting a rigidly setting pourable compound into the void space defined by said negative mold form and said elastomeric hull;

permitting said rigidly setting compound to solidify to a final skeleton section;

removing said negative mold form from said final skeleton section, said elastomeric hull remaining stretched thereover; and

locating casting cores in an innder void space defined by said elastomeric hull stretched over said final skeleton section;

injecting a foamed material into said inner void space,; and

permitting said foamed material to set whereby said inner void space is provided with voids for protectively receiving and surrounding apparatuses associated with said medical training purposes.

4,451,417

METHOD OF PRODUCING EXTRUDED PLATE-LIKE POLYSTYRENE FOAM

Hiroyuki Akiyama; Hidewo Hatakeyama, both of Hiratsuka; Nobuyoshi Shimoyashiki, Kanuma; Yoshiaki Momose, Hiratsuka, and Fusao Imai, Kanuma, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,218
Claims priority, application Japan, Dec. 25, 1981, 56-209318
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 3 Claims

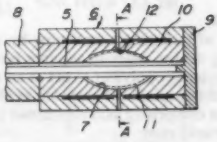
1. In a method of producing a plate-like polystyrene resin foam by extruding a molten mixture of a polystyrene resin and a volatile blowing agent from an extruder into a zone kept at a lower pressure than the inside of the extruder, the improvement which comprises extruding a mixture of a polystyrene resin having a weight average molecular weight, measured by gel permeation chromatography, of 20×10^4 to 35×10^4 with from 8 to 17 parts by weight per 100 parts by weight of the polystyrene resin of a volatile blowing agent which is a mixture consisting of 50 to 80% by weight of dichlorodifluoromethane and 50 to 20% by weight of ethyl chloride from said extruder into said zone kept at a lower pressure than the inside of the extruder, said plate-like polystrene resin foam having a heat conduction resistance R, determined for a 25 mm-thick specimen kept at an average temperature of 75° C., of at least 5.

4,451,418

METHOD FOR FORMING A GREEN BODY OF CERAMIC ARC TUBES USED FOR A METAL VAPOR DISCHARGE LAMP AND A MOLDING DIE FOR FORMING SAID TUBE

Mamoru Furuta, Toyoake; Yoshio Maeno, and Kazuo Kobayashi, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 30, 1982, Ser. No. 403,401
Claims priority, application Japan, Aug. 4, 1981, 56-121316
Int. Cl.³ C04B 35/64
U.S. Cl. 264—63 5 Claims



1. A method for forming a green body of a ceramic green arc tube for a metal vapor discharge lamp wherein an outer diameter of an arc discharging portion is larger than that of end portions of the arc tube which hold discharging electrodes, comprising: preparing a stiff plastic body consisting essentially of a ceramic material, having alumina as a major component, and a binder having a thermal gelatinizing organic substance as a major component; forming the prepared body into a straight tubular body by an extrusion means; placing the tubular body into an inner cavity of a modding die having an inner portion corresponding to a desired outer shape of the ceramic arc tube, wherein the molding die has been previously heated; closing one end portion of the tubular body; applying a compressed fluid from another opened end portion of the tubular body into the inside of the tubular body to inflate the central portion of tubular body until the green body contacts the inner portion of the molding die; hardening and drying the inflated green body with the heat of the previously heated molding die; and ejecting the dried body from the die.

4,451,419

APPARATUS AND PROCESS FOR THE PRODUCTION OF PILE SURFACE ARTICLES

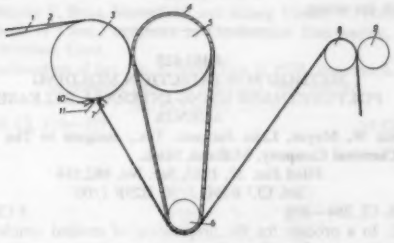
Donald J. Bye, Runcorn; Harold P. Stanistreet, Iontypool, both of England, and Werner Lindenstruth, Oestringen, Fed. Rep. of Germany, assignors to Imperial Chemical Industries, PLC, London, England

Continuation of Ser. No. 611,243, Sep. 8, 1975, Pat. No. 4,436,687, which is a continuation of Ser. No. 417,597, Nov. 20, 1973, abandoned. This application Jan. 17, 1980, Ser. No. 112,919

Claims priority, application United Kingdom, Dec. 4, 1972, 55831/72

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—164 10 Claims



1. In a process for the production of a pile surfaced thermoplastic material comprising feeding a high porosity backing and a thermoplastic material to a substantially smooth surfaced roll in a manner such as to hold the front of the backing against the thermoplastic material and to hold the thermoplastic material in contact with the roll while holding the roll at a temperature above the softening point of the thermoplastic so that the thermoplastic bonds to the backing and adheres to the surface, separating the resulting laminate of the backing and the thermoplastic material from the heated surface so that fibrils are drawn out from the thermoplastic material between the backing and the surface in a fibril forming area, cooling the fibrils so formed to below the softening temperature of the thermoplastic and disjoining the fibrils from the heated surface the improvement wherein the thermoplastic material is hauled off sharply at an angle greater than 90 degrees from the heated surface along an edge extending across the width of the roll, said edge being provided by a rod or bar having a slot or holes therein and having a radius of curvature of between 1 and 8 millimeters at the point where the backing passes thereover, said rod or bar being positioned transverse to the direction of movement of the material and at a distance from the surface of the roll greater than the combined thickness of the thermoplastic material and the backing, said rod or bar fixing the point at which the thermoplastic separates from the surface and thereby controlling the direction of the path of the material as it moves away from the heated surface, said rod or bar being of a shape such that a stream of cooling fluid is directed through the slot or holes in the rod or bar into the back of the backing.

4,451,420

SYNTACTIC PHASE EXTRUSION

Herbert W. Keuchel, 765 Forestview Dr., Tallmage, Ohio 44278

Filed Feb. 25, 1981, Ser. No. 238,269

Int. Cl.³ D01D *5/20*

U.S. Cl. 264—167 6 Claims

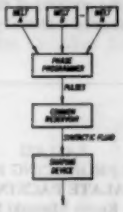
1. A process for providing a mixture of polymeric phases which consist of

separately providing a plurality of fluid polymeric materials having different phases;

separately and sequentially injecting pulses of said plurality of fluid polymeric materials into a plurality of flow channels so as to provide polymeric components having alternate phase characteristics;

discharging said fluid components from said flow channels;

combining said fluid components in a common reservoir so as to form a mosaic-like dispersion; and



flowing said mosaic-like dispersion from said reservoir through a shaping device so as to provide a mosaic structure.

4,451,421

CONTINUOUS CASTING OF STRINGERS FOR SLIDING CLASP FASTENERS

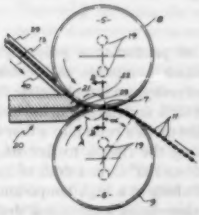
Arthur L. Jones, Glenbrook, and Ronald G. Seeney, Kingswood, both of Australia, assignors to Scovil, Inc., Waterbury, Conn.

Continuation of Ser. No. 272,975, Jun. 12, 1981, abandoned, which is a continuation of Ser. No. 142,979, Apr. 23, 1980, abandoned, which is a continuation of Ser. No. 902,545, May 2, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 429,202

Claims priority, application Australia, May 4, 1977, PC9975

Int. Cl.³ B29D *23/05*

U.S. Cl. 264—167 4 Claims



1. In an improved method of continuous casting a row of thermoplastic slide fastener interlocking elements upon a longitudinal edge of a stringer tape of indefinite length by an extrusion nozzle having an orifice and supplying thermoplastic material in advance of a nip between a pair of rotatable casting rollers, each having peripheral cavities for the casting of said interlocking elements, said improved method comprising the steps of:

driving said pair of casting rollers at a relatively high speed while at the same time insuring adequate solidification of said interlocking elements before removal therefrom by drawing said stringer tape between said nozzle and a first one of said rollers and to a first side of said nip during extrusion of said thermoplastic material, from said orifice initially into the cavities of said first roller in advance of said nip for initially solidifying the portions of said interlocking elements on the upper surface of said stringer tape and subsequently into the cavities of the second one of said rollers, and delaying the removal of said stringer tape by recovering said stringer from the other side of said nip at such an angle with respect to said second roller of from about 30° to about 45°, such that said interlocking ele-

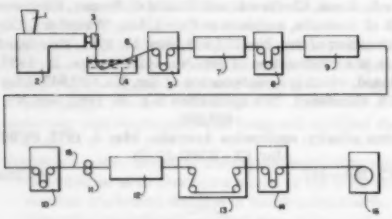
ments cast on said stringer tape are separated from the cavities of said first roller before they are separated from the cavities of said second roller and said interlocking elements further remaining in the cavities and in contact with said second roller for the 30°–45° angular segment portion of its rotation, thereby providing sufficient time for hardening of the portions of the interlocking elements on the lower surface of said stringer tape.

4,451,422

METHOD FOR PRODUCING POLYETHYLENE TEREPHTHALATE PACKING MATERIAL

Ryosuki Yui; Ketsuke Kume; Masaaki Hashi, all of Neagarimachi, and Junji Niikura, Kanazawa, all of Japan, assignors to Sekisui Jushi Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 210,859, Nov. 26, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,543
Claims priority, application Japan, Nov. 30, 1979, 54-155753; Mar. 3, 1980, 55-26885
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—178 R **2 Claims**



1. A method of producing a polyethylene terephthalate packing band which comprises melt-extruding through an extrusion die a polyethylene terephthalate dried to a moisture content of up to 0.02% and having an intrinsic viscosity of 0.90 to 1.20, cooling the molten resin into a first water tank to give a ribbon, subjecting the ribbon to first-stage stretching at a temperature of 85° to 100° C. to a draft of 3 to 4.5 times and to second-stage stretching at a high temperature of 250° to 350° C. to give a total cumulative longitudinal draft of 4.6 to 6 times.

4,451,423

PROCESS FOR THE PRODUCTION OF FLAME RESISTANT MOULDED POLYMER ARTICLES

Ulrich Reinehr; Toni Herbertz, and Günter Spilgies, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,402
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140274
Int. Cl.³ C08K *3/22, 3/16*
U.S. Cl. 264—182 **7 Claims**

1. A process for the production of polyacrylonitrile filaments which contain antimony trioxide comprising adding antimony halide to a solution of a halogen-containing acrylonitrile polymer in an organic solvent, said antimony halide added in a quantity of from 1 to 10% by weight, based on the polymer content, spinning the solution to form filaments and contacting said filaments with water.

4,451,424

METHOD OF GELLING CAST, POLYSULFONE MEMBRANES

Thomas A. Tweddle, Orleans; William L. Thayer, Ottawa; Oleh Kutowy, North Gower, and Srinivasa Sourirajan, Ottawa, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Sep. 10, 1982, Ser. No. 417,494
Claims priority, application Canada, Feb. 10, 1982, 395978
Int. Cl.³ B29D *7/06*
U.S. Cl. 264—216 **8 Claims**

1. In a method of gelling cast, polysulfone films to form reverse osmosis and ultrafiltration membranes, wherein the cast film is gelled using water as a gelation liquid, the improvement comprising, partially gelling the film with at least one mineral acid at a stage no later than when the film is gelled with the water.

4,451,425

METHOD FOR INJECTION MOLDING POLYURETHANE USING INTERNAL RELEASE AGENTS

Louis W. Meyer, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1983, Ser. No. 462,154
Int. Cl.³ B29C *5/00*; B29F *1/00*
U.S. Cl. 264—300 **5 Claims**

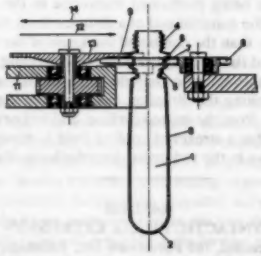
1. In a process for the preparation of molded articles by injecting a polyurethane-forming composition containing at least one active hydrogen-containing material containing an average of more than one active hydrogen atom per molecule and at least one material containing an average of more than one -NCO group per molecule into a mold and thereafter removing a resultant polyurethane molded article therefrom; the improvement which comprises employing as said polyurethane-forming composition one which contains an effective amount of, as a mold release agent, at least one hydroxylated lecithin.

4,451,426

PROCESS FOR BLOW-MOLDING A HOLLOW ARTICLE FROM A PREFORM MADE FROM A THERMOPLASTIC

José Branchadell, Wezembeek-Oppem, Belgium, assignor to SOLVAY & Cie, Brussels, Belgium

Filed Feb. 18, 1982, Ser. No. 350,098
Claims priority, application France, Feb. 23, 1981, 81 03708
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—535 **3 Claims**



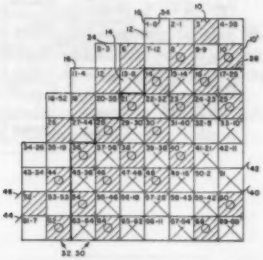
1. Process for blow-moulding a hollow article, comprising: moulding, from a thermoplastic, a preform having a body of cylindrical general shape surmounted by a profiled false neck possessing a circular toothed collar located in a plane at right angles to the longitudinal axis of the preform; thermally conditioning the preform while causing the preform to rotate about its longitudinal axis by means of a toothed drive member cooperating with the circular toothed collar; and then blow-mould-

ing the desired final hollow article from the conditioned preform.

4,451,427
IN-CORE FUEL MANAGEMENT FOR NUCLEAR REACTOR

Malcolm F. Ross, Bloomfield, and Sidney Visner, W. Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 874,955, Feb. 3, 1978, abandoned. This application Nov. 21, 1980, Ser. No. 209,165
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—267 **19 Claims**



18. In a pressurized water power reactor having about 241 elongated, square fuel assemblies supported side-by-side to form a generally cylindrical stationary core, the core having produced power for at least three previous burnup cycles of at least 10,000 MWD/T each, a method for refueling the core comprising the steps of:

(a) permanently removing from the core assemblies having experienced at least three burnup cycles;

(b) figuratively dividing the core into a generally cylindrical inner region consisting of about 145 assembly locations and a generally annular outer region consisting of the remaining assembly locations;

(c) inserting fresh assemblies having permanent burnable poison lattice shims into the inner region and relocating burned assemblies to form a checkerboarded inner region having

(1) a first checkerboard component consisting substantially entirely of about equal numbers of fresh assemblies and assemblies having burned through only one previous burnup cycle,

(2) a second checkerboard component consisting substantially entirely of assemblies having burned through at least two previous burnup cycles,

(d) inserting fresh assemblies into the outer region and relocating burned assemblies to form a checkerboarded outer region having

(1) a third component consisting substantially entirely of fresh assemblies

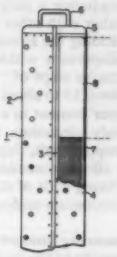
(2) a fourth component consisting of assemblies having experienced at least one burnup cycle, wherein

(3) about half the core peripheral locations are occupied by fresh assemblies.

4,451,428
CONTROL RODS AND METHOD OF PRODUCING SAME

Eiichi Nishimura; Shunsuke Uchida, both of Hitachi; Masao Kitamura, Hitachiota; Koichi Saito, Hitachi; Eishi Ibe, Katsuta, and Tatsuo Hayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 2, 1981, Ser. No. 222,060
Claims priority, application Japan, Jan. 7, 1980, 55-112
Int. Cl.³ G21C *7/10*
U.S. Cl. 376—333 **16 Claims**



5. A control rod for a nuclear reactor comprising an absorber rod means extending in the direction of insertion of the control rod in a reactor core, said absorber rod means being charged with a material having a large neutron absorption cross section for causing an (n, α) reaction to take place upon absorbing neutrons, and neutron absorbing plates extending in the insertion direction of the control rod and being arranged at a forward end portion of the control rod, said neutron absorbing plates being formed of an alloy of a material of a large neutron absorption cross section and a material of a small neutron absorption cross section for causing an (n, Y) reaction to take place upon absorbing neutrons, the mixing ratio of said material of small neutron absorption cross section to said material of large neutron absorption cross section in said alloy being continuously varied in the insertion direction from at least a predetermined position along the extent of a major portion of said neutron absorbing plates and becoming increasingly higher toward the forward end of the control rod, said neutron absorbing plates having a volume which exhibits substantially no decrease along the extent of said neutron absorbing plates in the insertion direction and said material charged in said absorber rod means and said material of said neutron absorbing plate have substantially the same neutron absorbing capacity in an area between the absorber rod means and the neutron absorbing plate.

4,451,429
PULVERIZING SPUTTERED DEPOSITS TO MAKE POWDERED METAL

Morris Berg, Champaign, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1982, Ser. No. 396,355
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—33 **6 Claims**

1. A method of making a metal powder from a mass of ductile metal that cannot be readily mechanically comminuted comprising the steps of sputtering the mass of ductile metal into a vacuum environment to produce a brittle deposit of the metal, gathering at least some of the brittle metal deposit, and pulverizing it into metal particles.

4,451,430

METHOD OF PRODUCING COPPER ALLOY BY MELTING TECHNIQUE

Seika Matidori; Koichi Teshima, both of Tokyo, and Masato Sakai, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawaski, Japan

Continuation of Ser. No. 374,910, May 4, 1982, abandoned, which is a continuation of Ser. No. 175,014, Aug. 7, 1980, abandoned. This application Sep. 23, 1983, Ser. No. 534,634
Claims priority, application Japan, Aug. 7, 1979, 54-99884
Int. Cl.³ C22C *1/06, 9/00*
U.S. Cl. 420—492 **7 Claims**

1. A method of producing a zirconium-containing alloy by melting copper, together with other alloying ingredients, in an air atmosphere, and adding the zirconium in two separate steps to assure uniform dispersion within the melt, said method comprising the successive steps of:

(a) melting from about 85 to about 95% by weight of copper of the total copper content in a crucible in air;

(b) introducing only zirconium in at least a deoxidizing amount to the copper melt; thereafter

(c) introducing an alloying amount of zirconium to the substantially deoxidizing melt of step (b), thereby dispersing the thus added zirconium uniformly throughout the melt; and

(d) adding the remaining amount of copper of about 5 to about 15% by weight to the melt, thereby rapidly cooling the melt to a casting temperature and minimizing the loss of zirconium added in step (b), the melt being substantially exposed to an air atmosphere during steps (a), (b), (c) and (d).

4,451,431

MOLYBDENUM-CONTAINING HIGH TEMPERATURE COATINGS FOR NICKEL- AND COBALT-BASED SUPERALLOYS

Subhash K. Naik, Milford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Oct. 25, 1982, Ser. No. 436,469
Int. Cl.³ B32B *15/04*
U.S. Cl. 420—588 **26 Claims**

1. An article of manufacture comprised of a superalloy substrate coated with a high temperature coating composition consisting, essentially of from about 10% to about 40%, by weight, chromium; from about 0.5% to about 9% by weight, molybdenum; from about 10% to about 35%, by weight, cobalt; from about 5% to about 20%, by weight, aluminum; from about 0.1% to about 1% by weight, yttrium; and the balance nickel, the nickel or nickel plus cobalt content, in percent by weight, being equal to or greater than percent by weight molybdenum divided by 0.18.

4,451,432

Patent Not Issued For This Number

4,451,433

AUTOMATIC CHEMICAL ANALYZER

Katsuji Yamashita; Hiroshi Umetsu, both of Katsuta; Hirotaka Sato, Hitachi; Yoshio Matsuoka, and Kei Kida, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,078
Claims priority, application Japan, Nov. 10, 1980, 55-158664
Int. Cl.³ G01F *23/24*; G01N *35/02, 35/06*
U.S. Cl. 422—63 **12 Claims**

1. An automatic chemical analyzer comprising:

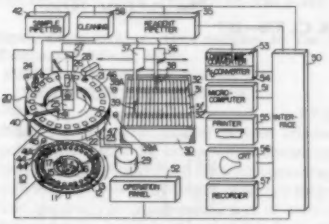
a reaction vessel for retaining a sample and reaction solution;

first pipetting means having a first pipetting tube for sucking the sample therein from a sample container and transporting the sample sucked in said first pipetting tube into said reaction vessel;

a reagent container containing the reagent solution;

second vertically movable pipetting means having a second pipetting tube for sucking the reagent solution therein from said reagent container and transporting the reagent solution sucked in said second pipetting tube into said reaction vessel;

sensor means for sensing a liquid level of the reagent solution in said reagent container, said sensor means being vertically movable with the movement of said second pipetting tube, said sensor means including a pair of electrically conductive members, one of which is said second pipetting tube and the other of which is a probe having a lower end positioned above an open end of said second pipetting tube;



pulse motor means for vertically moving said sensor means;

means for producing a detection signal when the probe of said sensor means is brought into contact with the reagent solution in said reagent container;

means for obtaining information relating to the amount of the reagent solution remaining in said reagent container based on the position of said sensor means within said reagent container when said sensor means produces said detection signal;

means for displaying the information relating to the amount of the remaining reagent solution; and

measuring means for measuring physical characteristics of the reaction solution in said reaction vessel.

4,451,434

TRANSPARENT OPTICAL CONTAINER FOR NON-DESTRUCTIVE BIOLOGICAL FLUID ASSAY

Hiram Hart, 3450 Wayne Ave., Bronx, N.Y. 10467

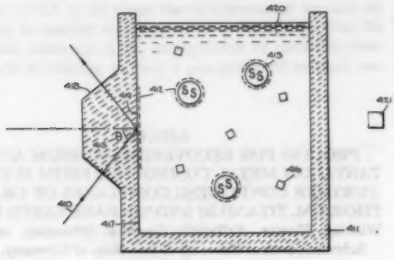
Division of Ser. No. 890,325, Mar. 27, 1978, Pat. No. 4,271,139. This application Jul. 17, 1980, Ser. No. 169,717
Int. Cl.³ G01N *33/54, 21/03*
U.S. Cl. 422—102 **7 Claims**

1. A transparent optical container system for use in the non-destructive biological fluid assay of immunological attractive material by excitement of scintillating particulates and the measurement of said excitement, the improvement wherein:

said transparent container having a side provided with a section forming a quadrilateral prism,

said prism having an interface base provided with immunological linking material for attachment to said scintillating particulates,

said prism inherently providing an angle of incidence greater than the critical angle for an electromagnetic beam of radiation,



said prism inherently providing on said interface base a substantially complete reflection of said electromagnetic beam of radiation exciting said scintillating particulates attached to said immunological material,

a measure of said excitement correlated to a measure of said attached immunological linking material.

4,451,435

APPARATUS FOR CLEANING AIR LOADED WITH POLLUTANTS

Heinz Hölter, Beisenstr. 39-41, 4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund-Wickede, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

PCT No. PCT/EP81/00153, 371 Date Jun. 4, 1982, 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01348, PCT Pub. Date Apr. 29, 1982

PCT Filed Sep. 30, 1981, Ser. No. 387,853

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039238; Nov. 11, 1980, 3042455; Jan. 31, 1981, 3103302; Jan. 31, 1981, 3103303; Jul. 9, 1981, 3127129

Int. Cl.³ B01D *53/36*

U.S. Cl. 422—171 **15 Claims**

1. An apparatus for cleaning pollutant-laden air to be admitted to a person-occupied enclosure, comprising:

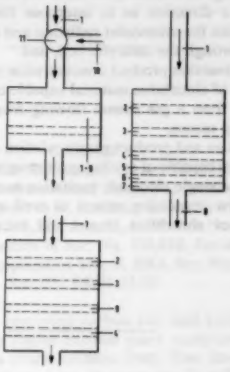
a partial heating stage traversed by said air for raising the temperature thereof above an incoming-air temperature to a temperature level at which absorption of pollutants from the air is promoted;

a housing provided with a multilayer gas filter downstream of said partial heating stage, said multilayer gas filter including

a sorption mass for the absorption of pollutants from the air at said temperature level, and

a catalyst mass for reaction of other pollutants in said air at a temperature higher than said level to remove said other pollutants, said sorption and catalyst masses being traversed in succession by the air;

a further heating stage in the path of said air between said



masses and upstream of said catalyst mass for heating said air to said temperature higher than said level for reaction in said catalyst mass; and

cooling means downstream of said filter for cooling the air before it is admitted to said enclosure.

4,451,436

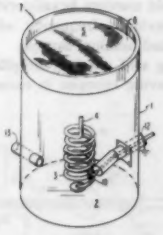
NITROGEN FIXATION BY PLASMA AND CATALYST

Louis R. O'Hare, 1700 Banyan #3, Fort Collins, Colo. 80526

Filed Feb. 1, 1983, Ser. No. 442,367

Int. Cl.³ C01B *21/20*

U.S. Cl. 422—186.29 **18 Claims**



1. A gas phase chemical reaction system comprising:

(1) gas particle excitation means capable of placing into chemically excited states gas molecules and atoms with an electric discharge in the form of a plasma from a single electrode discharge with the electrode receiving very high radio frequency current at very high impedance and having a radio frequency shield to prevent electromagnetic radiation energy loss, and

(2) catalyst contacting and ultraviolet radiation shielding means in the form of a mass of opaque catalytic substance capable of being contacted in such a way by a gas stream containing excited gas species from said excitation means that the excited gas particles are shielded by the catalytic material when they move from the area of the electric excitation and ultraviolet radiation into and through small openings in the catalytic material, said openings being in such a direction as to interpose the catalytic material between the ultraviolet radiation and the gas stream flowing through the catalytic bed, and

(3) first reaction product concentration means in the form of a bed of absorbtive material capable of absorbing product gases from a gas stream flowing from said catalyst contacting means,

(4) reactant and product gas circulation means in the form of a pump capable of cycling gas through a chamber containing the single electrode excitation means and through the catalyst contacting means as well as through the first product absorbtion means and back to the excitation means.

4,451,437

METHOD FOR SEPARATING DIFFERENT ISOTOPES IN COMPOUNDS BY MEANS OF LASER RADIATION

Gustav Meyer-Kretschmer, Jülich; Heinz Jetter, Feldkirchen, and Peter Toennies, Göttingen, all of Fed. Rep. of Germany, assignors to URANIT Uran-Isotopentrennungs-GmbH, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 051,240, Jun. 22, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,187

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829851

Int. Cl.³ B01D *59/00, 59/50*

U.S. Cl. 423—3 **7 Claims**

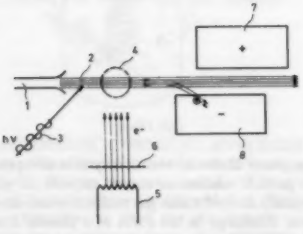
1. A method for separating uranium isotopes of uranium hexafluoride having molecules in the gaseous state comprising the steps of:

(a) mixing said uranium hexafluoride with an inert additive gas;

(b) cooling the resulting mixture by adiabatic expansion to a temperature below 50° K.;

(c) exciting said uranium hexafluoride molecules with laser radiation having a frequency which is selective for a predetermined uranium isotope;

(d) interacting said uranium hexafluoride molecules with electrons having energies in excess of 14 electron volts



thereby producing positive ions by electron bombardment; and

(e) separating said ionized uranium hexfluoride molecules from the nonionized molecules.

4,451,438

PROCESS FOR RECOVERING NIOBIUM AND/OR TANTALUM METAL COMPOUNDS FROM SUCH ORES FURTHER CONTAINING COMPLEXES OF URANIUM, THORIUM, TITANIUM AND/OR RARE EARTH METALS

Wilfried Floeter, Erftstadt; Gerhard Schoening, and Klaus Schroeer, both of Bonn, all of Fed. Rep. of Germany, assignors to Herman C. Starck Berlin, Berlin and Uranerzbergbau-GmbH, Bonn, both of, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,244

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211286

Int. Cl.³ C01G *43/00, 33/00, 35/00;* **C01F** *15/00*

U.S. Cl. 423—20 **11 Claims**

1. A process for recovering tantalum and/or niobium metal compounds substantially free of radioactive contamination from an ore containing one or more compounds of said metal or metals and further containing at least one complex of a member selected from the group consisting of uranium, thorium, radium, titanium, and rare earth metals, wherein the crushed ore is first decomposed with hydrofluoric acid at an elevated temperature for more than three hours with substantially all the uranium, thorium, and radium compounds remaining in the residue, and substantially all the tantalum and/or niobium being dissolved as complexes with fluoride, and subsequently said hydrofluoric solution is further treated in an appropriate manner to recover niobium and/or tantalum compounds in said ore.

4. A process according to claim 1, wherein the solid residue is decomposed with concentrated sulfuric acid under oxidizing conditions to convert the elements uranium and thorium into water-soluble compounds, whereupon the solution is further treated in an appropriate manner to recover uranium and thorium.

4,451,439

PROCESS FOR THE PURIFICATION OF SOLUTIONS CONTAINING A SODIUM OR POTASSIUM CARBONATE, SULPHATE, AND POSSIBLY HYDROXIDE, AND AT LEAST ONE OF THE METALS VANADIUM, URANIUM AND MOLYBDENUM

Pierre Maurel, Aix-en-Provence; Bernard Bosca, Gardanne, and Francois Nicolas, Aix-en-Provence, all of France, assignors to Pechiney, Lyon, France

Continuation of Ser. No. 946,025, Sep. 26, 1978, abandoned. This application Nov. 23, 1981, Ser. No. 324,060

Claims priority, application France, Sep. 30, 1977, 77 30176; Aug. 18, 1978, 78 24843; Aug. 18, 1978, 78 24844

Int. Cl.³ C01G *39/06;* **C01F** *11/18;* **C01D** *5/00*

U.S. Cl. 423—55 **18 Claims**

1. A process for the purification of an aqueous solution wherein said aqueous solution initially contains (1) a sulphate,

a carbonate and a hydroxide or hydrogen carbonate of one of the alkali metals sodium or potassium, and (2) at least one of the metals selected from the group consisting of vanadium, uranium and molybdenum in the form of sodium or potassium salts, and (3) inorganic and/or organic impurities, said process comprising the steps of:

(a) reacting at a temperature up to the boiling point temperature of said aqueous solution containing the metal salts with lime added to the solution in an amount within the range of 0.1 to 20 times the stoichiometric amount required to convert any carbonates to hydroxides plus the amount taken up in the precipitation of insoluble compounds of calcium to form a precipitate of calcium carbonate and other insoluble organic and inorganic calcium salts in a hydroxide-enriched liquor;

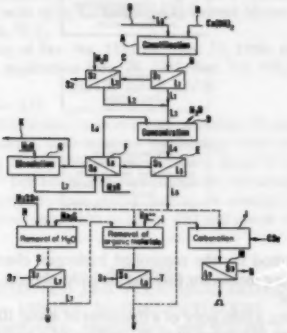
(b) separating the precipitate from the hydroxide-enriched liquor;

(c) washing the separated precipitate to form a wash liquor;

(d) mixing said wash liquor and said hydroxide-enriched liquor;

(e) concentrating the hydroxide-enriched liquor and wash liquor mixture to a hydroxide content which does not exceed 50% by weight to precipitate alkali metal sulphate, leaving a mother liquor; and

(f) separating the alkali metal sulphate precipitate from the mother liquor.



4,451,440

UTILIZATION OF ION EXCHANGE RESIN IN THE PROCESSING OF KAOLINS

Thomas D. Thompson, III, Upper Black Eddy, Pa., assignor to Georgia Kaolin Company, Inc., Elizabeth, N.J.

Filed Oct. 28, 1982, Ser. No. 437,610

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **8 Claims**

1. A method of processing naturally occurring kaolin clay, comprising:

(a) preparing an aqueous suspension of crude kaolin clay having a solids content of at least about 50%;

(b) fractionating said kaolin suspension into a fine particle clay slip and a coarse particle residue;

(c) reacting the fine particle clay slip with an aqueous bleaching agent and an ion exchange resin saturated with sodium cations and an ion exchange resin saturated with phosphate anions; and

(d) drying the reacted fine particle clay slip to a preselected solids content.

4,451,441

METHOD FOR EXHAUST GAS TREATMENT

Michael V. Ernest, Baltimore, and James M. Maselli, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 394,220, Jun. 21, 1982, Pat. No. 4,426,320, which is a continuation of Ser. No. 228,832, Jan. 27, 1981, abandoned. This application Sep. 9, 1983, Ser. No. 523,511

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—213.2 **5 Claims**

1. A method for removing carbon and lead particles from internal combustion engine exhaust gases comprising passing the gases through a coarse ceramic foam filter having a pore size of from about 2 to about 20 pores per 25 millimeters in length and then through a fine ceramic foam filter having a pore size of from about 15 to about 50 pores per 25 millimeters in length.

3. The method of claim 1 in which the filters further comprise a carbon combustion catalyst material deposited on the filters.

4,451,442

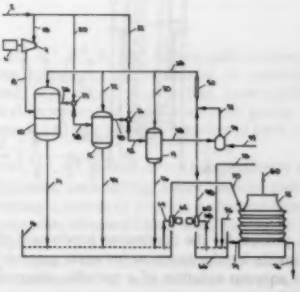
REMOVAL OF HYDROGEN SULFIDE FROM FLUID STREAMS WITH MINIMUM PRODUCTION OF SOLIDS

Gaines C. Jeffrey, Houston; Lance A. Cooper, Lake Jackson, both of Tex., and Sharon S. Whipple, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1982, Ser. No. 390,617

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—224 **15 Claims**



1. A continuous process for removing hydrogen sulfide from a fluid stream containing hydrogen sulfide which comprises

(A) contacting said stream in a first reaction zone with an aqueous solution at a pH range suitable for removing hydrogen sulfide whereby said solution contains an effec-

tive amount of a polyvalent metal chelate and an effective amount of an oxidizing agent capable of oxidizing elemental sulfur to soluble sulfur compounds whereby said hydrogen sulfide is converted to free sulfur and then to soluble sulfur compounds and said polyvalent metal chelate is reduced to a lower oxidation state metal chelate,

(B) contacting said solution containing reduced polyvalent metal chelate in a second reaction zone with a oxygen containing gas stream whereby said metal chelate is continuously reoxidized, and

(C) continuously recirculating said reoxidized solution back to said first reaction zone.

4,451,443

CAUSTICIZATION METHOD

Stephen C. Libby, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,510
Int. Cl.³ C01F *5/24*
U.S. Cl. 423—432 **5 Claims**

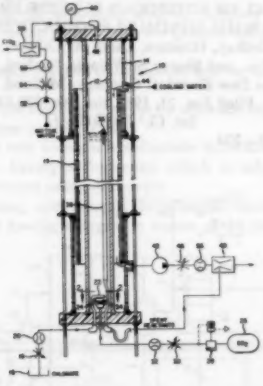
1. The causticization method comprising the steps of calcining limestone in the presence of additive means for producing lime of increased lime efficiency relative to the lime that would result from calcining said limestone without the presence of said additive means, said additive means comprising an alkali metal compound, said lime efficiency being determined on a sodium carbonate solution for which conditions, other than the character of the lime, are fixed, and subsequently feeding the lime of increased lime efficiency into said sodium carbonate solution for producing sodium hydroxide and calcium carbonate from the sodium carbonate.

4,451,444

METHOD AND APPARATUS FOR PRODUCING CHLORINE DIOXIDE

Paul W. Santillie, Richland, and Daniel M. Ramras, Seattle, both of Wash., assignors to Lamb-Weston, Inc., Portland, Oreg.

Filed Oct. 21, 1981, Ser. No. 313,256
Int. Cl.³ C01B *11/02*
U.S. Cl. 423—480 **7 Claims**



1. A process for the continuous production of gaseous chlorine dioxide by the reaction between gaseous sulfur dioxide and an aqueous solution of a metallic chlorate, said method comprising:

(a) supplying a flow of an aqueous solution of a metallic chlorate to the bottom of a reaction chamber;

(b) supplying a flow of gaseous sulfur dioxide to the bottom of said reaction chamber and thereby bringing said sulfur dioxide into contact with said aqueous solution;

(c) withdrawing from the top of said reaction chamber gaseous chloride dioxide; and

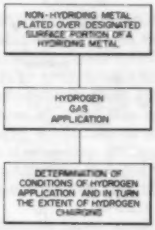
(d) withdrawing from said reaction chamber, at an intermediate location, liquid remaining after said contact between said sulfur dioxide and said aqueous solution.

4,451,445

METHOD FOR CONTROLLED HYDROGEN CHARGING OF METALS

Bo-Ching Cheng, and Ronald B. Adamson, both of Fremont, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 31, 1982, Ser. No. 413,534
Int. Cl.³ C01B *6/02*
U.S. Cl. 423—645 **11 Claims**


NON-HYDRIDING METAL PLATED OVER DESIGNATED SURFACE PORTION OF A HYDRIDING METAL
HYDROGEN GAS APPLICATION
DETERMINATION OF CONDITIONS OF HYDROGEN APPLICATION AND IN TURN THE EXTENT OF HYDROGEN CHARGING

1. A method for the controlled hydrogen charging of hydride forming metals for forming hydrides therein, comprising the steps of:

a. applying a thin layer of a thickness of about 10 to about 15 microns of copper over the surface of a hydride forming metal comprising zirconium and its alloys;

b. subjecting the surface of the hydride forming metal with the layer of copper thereon to hydrogen gas while exposed to an ambient temperature of about 200° to about 400° C.; and

c. determining the amount of hydrogen gas diffused through the thin layer of copper and into the hydride forming metal based upon the measurement of the ambient temperature of the hydrogen gas application, the copper layer thickness, and the duration of exposure to hydrogen gas.

4,451,446

PROCESS FOR THE PREPARATION OF POLYSACCHARIDE-PROTEIN COMPLEXES FROM BACTERIAL CAPSULES, OBTAINED PRODUCTS AND IMMUNOGENIC COMPOSITIONS CONTAINING THEM

Jean Vandevelde, Ottignies-Louvain-la-Neuve, and Robert De Neys, Rixensart, both of Belgium, assignors to SmithKline-Rit, Belgium

Filed Mar. 4, 1982, Ser. No. 354,878
Int. Cl.³ A61K *39/102, 37/00*; C07G *7/00*
U.S. Cl. 424—92 **13 Claims**

1. A process for preparing immunogenic lipopolysaccharide-free bacterial capsular polysaccharide-protein noncovalent complex from bacteria suspended in an aqueous medium which comprises inactivation of the bacteria by the addition of a quaternary ammonium salt immediately followed by collection of the insoluble fraction, take-up with a 0.2 to 2 N aqueous solution of a non toxic alkali- or alkaline-earth metal salt, precipitation of contaminants by addition of 5 to 40% (vol/vol) of a water-miscible alcohol, removal of the quaternary ammonium salt from the solution by addition of a water soluble iodide, sulfocyanide or benzoate and separation of the precipitate to yield an aqueous solution from which the immunogenic lipopolysaccharide-protein noncovalent complex is isolated.

10. An immunogenic lipopolysaccharide-free capsular polysaccharide-protein noncovalent complex of Haemophilus in-

fluenzae type b prepared by the process of claim 1 wherein the polysaccharide moiety is polyribosylribitol phosphate and wherein the protein moiety presents one methionine residue per molecule and which, when tested by sodium dodecyl sulfate polyacrylamide gel electrophoresis, shows two spots corresponding to 90 and 10% (wt/wt) of polypeptides accounting for the protein present in the complex, the main fraction being hydrophobic and of a molecular weight of 41,000 daltons, the total amount of protein in the complex being at least 30% of the complex weight.

12. A meningitis vaccine comprising an effective dose of the polysaccharide-protein complex of claim 10 in freeze-dried form with a stabilizer.

4,451,447
PHARMACEUTICAL FORMULATIONS

Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 135,373, Mar. 31, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,206

Int. Cl.³ A61K *33/24*

U.S. Cl. 424—131 **3 Claims**

1. A sterile, stable, concentrated solution of cisplatin in a sealed container, said solution containing from about 10 to about 15 mg of cisplatin per ml and from about 10 to about 15 mg of NaCl per ml in a solvent medium consisting of about 90% of a polyethylene glycol having an average molecular weight of from about 350 to about 450 and about 10% water.

4,451,448
1-SUBSTITUTED TRICYCLIC QUINAZOLINONES USEFUL AS TRANQUILIZERS

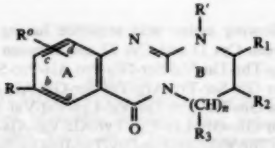
Goetz E. Hardtmann, Morristown, and William J. Houlihan, Mt. Lakes, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 401,647, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 302,484, Sep. 16, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,281

Int. Cl.³ A61K *31/505*; C07D *487/04*

U.S. Cl. 424—251 **29 Claims**

1. A compound of the formula:



wherein

R^o is hydrogen, halo of atomic weight of from 18 to 80, or alkyl of 1 to 3 carbon atoms,

R is halo of atomic weight of from 18 to 80, alkyl of 1 to 4 carbon atoms or trifluoromethyl,

R′ is alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, norbornyl, alkyl of 1 to 3 carbon atoms substituted by cycloalkyl of 3 to 7 carbon atoms or $—CH_2(F_xALK)$ wherein

X is 1 to 3 and ALK is alkyl of 1 to 4 carbon atoms,

R_1, R_2 and R_3 are each independently hydrogen or alkyl of 1 or 2 carbon atoms, and n is 0 or 1,

or a pharmaceutically acceptable acid addition salt thereof.

15. The method of tranquilizing a mammal comprising administering to a mammal a tranquilizing effective amount of a compound of claim 1.

29. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and a tranquilizing effective amount of a compound of claim 1.

4,451,449
XANTHINE DERIVATIVES, AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Joachim E. Goring, Gronau, Fed. Rep. of Germany, assignor to Johanna Wuelfing, Fed. Rep. of Germany

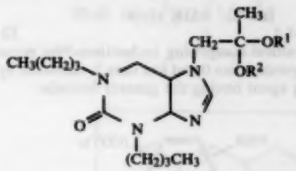
Continuation of Ser. No. 135,284, Mar. 31, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,569

Claims priority, application United Kingdom, Apr. 5, 1979, 7912050

Int. Cl.³ C07D *239/95*; A61K *31/52*

U.S. Cl. 424—253 **13 Claims**

1. A compound having the formula (III):



(III)

wherein R^1 and R^2 are are lower alkyl or taken together are C_2–C_4 alkylene.

4,451,450
CATIONIC COMPOUNDS USEFUL FOR MAKING RADIODIAGNOSTIC AGENTS

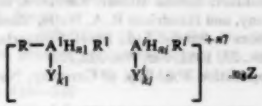
Vinayakam Subramanyam, Westwood, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Oct. 15, 1981, Ser. No. 311,770

Int. Cl.³ A61K *43/00, 49/00*; C07F *9/66, 9/90*

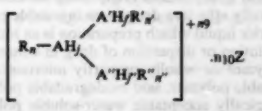
U.S. Cl. 424—1.1 **36 Claims**

1. A normally solid, hydrophilic compound capable of binding with Tc-99m to form a cationic complex and having a formula selected from:



(A)

or



(B)

wherein:

R, R′, R″, R^1, R^2, R^3, R^4, R^5 and R^6 are each independently selected from hydrogen; or substituted or unsubstituted alkyl, alkylene, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic group; and R plus R^j in formula (A) may be taken together to form a cyclic compound;

A, A′, A″, A^1, A^2, A^3, A^4, A^5 and A^6 are independently neutral functional elements, each having a free electron pair available for accepting a proton to provide a charged ligand and having the capability of complexing with Tc-99m to form a cationic complex;

Y^1, Y^2, Y^3, Y^4, Y^5 and Y^6 are each independently selected from hydrogen; or substituted or unsubstituted alkyl, alkylene, aryl, alkylaryl, arylalkyl, monocycloalkyl, polycycloalkyl, heterocyclic and carbocyclic groups;

Z is an anion;

i is an integer from 0 to 6;

j, j′ and j″ are each independently 0 or 1;

k^1, k^2, k^3, k^4, k^5 and k^6 are each independently 0 or 1;

n, n' and n'' are each independently the integer 1 or 2;
n_1, n_2, n_3, n_4, n_5, n_6, are independently 0 or 1;
n_7 and n_8 are each an integer from 1 to 6; and
n_9 and n_{10} are each an integer from 1 to 3.

4,451,451

RADIOPHARMACEUTICAL COMPOSITION BASED ON TECHNETIUM-99M AND REAGENT FOR MAKING IT

John Rimmer, Amersham, England, assignor to Amersham International plc, England

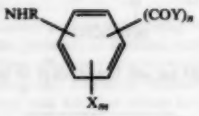
Filed Oct. 26, 1982, Ser. No. 436,689

Claims priority, application United Kingdom, Oct. 30, 1981, 8132778

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **12 Claims**

1. A composition comprising technetium-99m present in a valency state greater than 0 and less than 7, stabilized by means of a stabilizing agent having the general formula:



where
R is C1–C6 alkyl or hydrogen,
X is C1–C6 alkyl or OH,
m is 0, 1 or 2,
Y is OH or —NH.CH_2.COOH,
n is 1 or 2
or a salt, ester or amide thereof.

4,451,452

PHARMACEUTICAL COMPOSITIONS CONTAINING BIODEGRADABLE POLYMERS

Heinrich Deibig, Frankfurt; Roland Reiner, Eschborn, both of Fed. Rep. of Germany, and Hendricus B. A. Welle, Maarssen, Netherlands, assignors to Sandoz Ltd., Basel, Switzerland

Filed Nov. 23, 1981, Ser. No. 323,733

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045135

Int. Cl.³ A61K *31/74, 31/78*

U.S. Cl. 424—78 **8 Claims**

1. A pharmaceutical composition comprising an effective amount of a parenterally effective drug in an injectable preparation in a sterile carrier liquid which preparation is an intimate mixture of a solid solution or dispersion of drug in a matrix of a biodegradable polymer or wholly or partly microencapsulated by a biodegradable polymer, said biodegradable polymer being a pharmacologically acceptable water-soluble polymer having hydroxy groups attached to the polymer chain, in which less than all of said hydroxy groups are esterified by residues of pharmacologically acceptable mono- or di-carboxylic acids, the degree of esterification being such that said biodegradable polymer is water-swellable but water-insoluble under physiological conditions.

4,451,453

METHOD FOR TREATING CONTACT DERMATITIS

George E. Lay, Fountaintown, Ind., and Daniel H. Haigh, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 13, 1982, Ser. No. 367,844

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **7 Claims**

1. A method of controlling and treating dermatitis in humans caused by exposure of the skin to a plant of the genus Rhus which comprises the topical application of an effective amount of an allergen-imbibing, allergen-retaining polymer wherein said polymer is a crosslinked copolymer of isobornyl acrylate, isobornyl methacrylate, styrene, or alkylstyrene and at least one ester of a C_8 to C_{20} fatty alcohol with acrylic or methacrylic acid, crosslinked with a polyethylenically unsaturated crosslinking agent.

4,451,454

PROPHYLAXIS AND TREATMENT OF THROMBOEMBOLIC DISORDERS IN MAN AND IN WARM-BLOODED ANIMALS WITH BICARBONATE SALTS OF ALKALI METALS

Dennis W. Wong, 2853 Sunnyglen Rd., Torrance, Calif. 90505

Filed Jun. 16, 1981, Ser. No. 274,386

Int. Cl.³ A61K *33/00*

U.S. Cl. 424—127 **15 Claims**

11. A method of prevention of blood coagulation in man or in warm-blooded animals which comprises administering internally to said host a bicarbonate salt of an alkali metal at a dose of 0.05–4 mEq(5–350 mg)/kg body weight, said bicarbonate salt being selected from the group consisting of sodium bicarbonate and potassium bicarbonate.

4,451,455

α-AMYLASE INACTIVATOR, A PROCESS FOR ITS PREPARATION, AN AGENT BASED ON THIS INACTIVATOR AND ITS USE

László Vértesy, Eppstein; Miroslav Mracek, Frankfurt am Main; Gerhard Braunitzer, and Heinz Aschauer, both of Munich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,444

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038130; Feb. 26, 1981, 3107106

Int. Cl.³ A61K *37/02;* **C07C** *103/52;* **C12P** *21/00, 21/02*

U.S. Cl. 424—177 **9 Claims**

1. An α-amylase inactivator which is a member selected from the group consisting of (1) a first peptide, HOE 467-A, having a molecular weight of 7958, an isoelectric point of 4.35±0.15, the following amino acid composition

Asp 6	Glu 7	Ala 7		Tyr 6	Lys 1
Thr 8	Pro 3	Val 8	Ile 2		Arg 3
Ser 5	Gly 7	Cys 4	Leu 4	His 2	Trp 1

and the following amino acid sequence having a disulfide bridge between Cys 11 and Cys 27 and between Cys 45 and Cys 73: Asp-Thr-Thr-Val-Ser-Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His Gly-His-Ala-Arg-Tyr-Leu-Ala-Arg-Cys-Leu, and a second peptide, HOE 467-B, which is a degradation product of said first peptide, said degradation shortening the N-terminal end of said first peptide to produce said second peptide, said degradation product having an isoelectric point of 4.53±0.15 and the following amino acid composition

Asp 5	Glu 6–7	Ala 7		Tyr 6	Lys 1
Thr 6–8	Pro 3	Val 7–8	Ile 2		Arg 3
Ser 4–5	Gly 7	Cys 4	Leu 4	His 2	Trp 1

and comprising six components respectively of the following amino acid sequences each having disulfide bridges as noted:

(a) Thr-Thr-Val-Ser-Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-

Ser-His-Gly His-Ala-Arg-Tyr-Leu-Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 10 and Cys 26 and between Cys 44 and Cys 72;

(b) Thr-Val-Ser-Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His-Gly-His Ala-Arg-Tyr-Leu-Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 9 and Cys 25 and between Cys 43 and Cys 71;

(c) Val-Ser-Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His-Gly-His-Ala Arg-Tyr-Leu-Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 8 and Cys 24 and between Cys 42 and Cys 70;

(d) Ser-Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-ILe-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His-Gly-His-Ala-Arg Tyr-Leu-Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 7 and Cys 23 and between Cys 41 and Cys 69;

(e) Glu-Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His-Gly-His-Ala-Arg-Tyr Leu-Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 6 and Cys 22 and between Cys 40 and Cys 68; and

(f) Pro-Ala-Pro-Ser-Cys-Val-Thr-Leu-Tyr-Gln-Ser-Trp-Arg-Tyr-Ser-Gln-Ala-Asp-Asn-Gly-Cys-Ala-Glu-Thr-Val-Thr-Val-Lys-Val-Val-Tyr-Glu-Asp-Asp-Thr-Glu-Gly-Leu-Cys-Tyr-Ala-Val-Ala-Pro-Gly-Gln-Ile-Thr-Thr-Val-Gly-Asp-Gly-Tyr-Ile-Gly-Ser-His-Gly-His-Ala-Arg-Tyr-Leu Ala-Arg-Cys-Leu, with a disulfide bridge between Cys 5 and Cys 21 and between Cys 39 and Cys 67.

4,451,456

ANTITUMOR ANTIBACTERIAL AGENTS

Hideo Koshiyama, Musashino; Fumihide Sakai, Yokohama, and Hiroaki Ohkuma, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

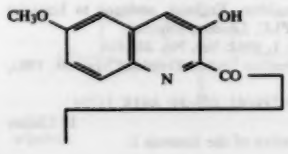
Division of Ser. No. 122,626, Mar. 6, 1980, Pat. No. 4,360,458, which is a continuation-in-part of Ser. No. 026,488, Apr. 2, 1979, abandoned. This application Jun. 21, 1982, Ser. No. 390,149

The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

Int. Cl.³ A61K *37/00*; **C07C** *103/52*; **C07G** *7/00*

U.S. Cl. 424—177 **4 Claims**

1. The pharmaceutical antitumor antibiotic composition in sterile injectible form comprising a pharmaceutical carrier substance, and BBM-928A having the formula



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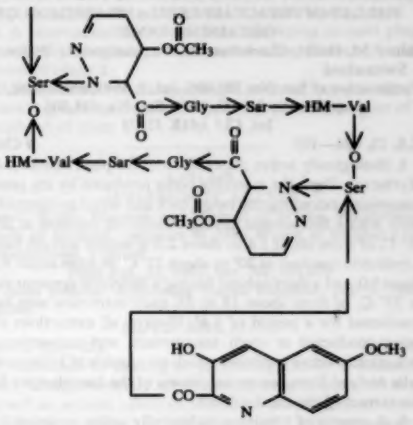


4,451,457

CYCLODEXTRIN AND METHOD FOR PROMOTING THE PROLIFERATION OF INTESTINAL BIFIDOBACTERIA

Chikao Yoshikumi, Kusitachi; Katsuo Sakurai, Hino; Yoshio Omura, Funabashi; Mayumi Nohara, Ryugasaki; Takao Ando, Nerima, and Isamu Motokawa, Hino, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Feb. 10, 1982, Ser. No. 347,726

Claims priority, application Japan, Feb. 18, 1981, 56-22620

Int. Cl.³ A61K *31/715*

U.S. Cl. 424—180 **5 Claims**

1. A method for promoting the proliferation of bacteria of the genus Bifidobacterium in the intestines of animals which comprises administering cyclodextrin to animals at the rate of 0.01 to 1 g per kg of body weight per day.

4,451,458

METHOD FOR THE TREATMENT OF POST-OPERATIVE THROMBOSIS

Hans Bühlmann, and Dieter Welzel, both of Nuremberg, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 119,583, Feb. 7, 1980, abandoned, which is a continuation of Ser. No. 942,807, Sep. 15, 1978, abandoned, which is a continuation of Ser. No. 890,165, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 703,256, Jul. 7, 1976, abandoned. This application May 17, 1982, Ser. No. 379,272

Int. Cl.³ A61K *31/725, 31/48*

U.S. Cl. 424—183 **3 Claims**

1. A method for the prophylactic treatment of post-operative thrombosis in mammals, comprising parenterally administering dihydroergotamine in conjunction with heparin, wherein the administration is effected with a unit dose comprising about 0.5 mg. of dihydroergotamine and about 2500–5000 I.U. of heparin and said doses are administered two to four times daily.

4,451,459

BIOLOGICALLY ACTIVE EXTRACTS FROM *MYRCIA FALLAX* (MYRTACEAE) PERU AND METHOD OF OBTAINING SAME

Sidney M. Hecht, Charlottesville, Va., assignor to Wofor AG, Switzerland

Continuation of Ser. No. 280,086, Jul. 2, 1981, abandoned. This application Jul. 23, 1982, Ser. No. 401,306

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 9 Claims

1. Biologically active materials from the plant *Myrica fallax*, Myrtaceae, Peru, the materials being produced by the process comprising extracting the twigs, bark and wood portions of the plant with a first solvent having a dielectric constant at 20° to 25° C. of from about 1.8 to about 2.0, a second solvent having a dielectric constant at 20° to about 25° C. of from about 3.5 to about 5.0, and a third solvent having a dielectric constant at 20° to 25° C. of from about 15 to 35, each extraction step being conducted for a period of 1 to 10 days, all extractions steps being conducted at room temperature, and recovering the biologically active materials which are capable of killing tumor cells derived from human carcinoma of the nasopharynx from the extract of the third solvent.

5. A process of obtaining biologically active materials from the plant *Myrica fallax*, Myrataceae, Peru, comprising extracting the twigs, bark and wood portions of the plant with a first solvent having a dielectric constant at 20° to 25° C. of from about 1.8 to 20, a second solvent having a dielectric constant at 20° to about 25° C. of from about 3.5 to about 5.0 and a third solvent having a dielectric constant at 20° to 25° C. of from about 15 to 35, each extraction step being conducted for a period of 1 to 10 days, all of the extraction steps being conducted for a period of 1 to 10 days, all of the extraction steps being conducted at room temperature, and recovering the biologically active materials which are capable of killing tumor cells derived from human carcinoma of the nasopharynx from the extract of the third solvent.

4,451,460

METHOD AND MEANS FOR REPELLING ANIMALS

Helge Hansen; Borje Nystrom, both of Stavanger, and Eyvin Torneng, Hinna, all of Norway, assignors to Nordtend A/S, Stavanger, Norway

PCT No. PCT/NO82/00039, 371 Date Feb. 23, 1983, 102(e) Date Feb. 23, 1983, PCT Pub. No. WO83/00417, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 2, 1982, Ser. No. 474,588

Claims priority, application Norway, Jul. 31, 1981, 812613

Int. Cl.³ A01N *45/00*

U.S. Cl. 424—238 9 Claims

1. A method for repelling animals by placing smelling repellent substances in the area from which the animals are to be kept off, characterized by the use as a repellent substances of one or more steroids which are synthetic or have been extracted from naturally occurring materials and which are of the type occurring on human skin or hair or in human sweat or urine and/or of one or more of the derivatives thereof obtainable by subjecting the steroids to air, moisture or micro-organisms in such a manner as to provide in the air a concentration perceptible to the sense of smell of the animals, said steroids being selected from the group consisting of testosterone, androsterone, dehydroepiandrosterone, 11-ketoaetiocholanalone, i-androstanalone, oestrone and androstenol.

4,451,461

10-(1-AZA-[2,2,2)-BICYCLO-3-OCTYL]-10H-2-PHENOTHIAZINESULFONAMIDE AND DERIVATIVES THEREOF

Marie-Christine Dubroeucq, Enghien-les-Bains, and Jean E. M. A. Rataud, Paris, both of France, assignors to Pharmindustrie, Gennevilliers, France

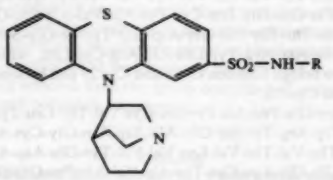
Filed Jul. 6, 1982, Ser. No. 395,235

Claims priority, application France, Jul. 10, 1981, 81 13602

Int. Cl.³ A61K *31/54;* C07D *453/00*

U.S. Cl. 424—246 7 Claims

1. 10-[1-aza-(2,2,2)-bicyclo-3-octyl]-10H-2-phenothiazinesulfonamides of the formula



(I)

wherein R represents methyl.

7. A method of treating a mammal afflicted with duodenal or gastric ulcers and to inhibit gastric secretion which comprises administering to said mammal a pharmaceutically effective amount of a composition containing a compound according to claim 1 or a pharmaceutically acceptable salt thereof in a pharmaceutically acceptable carrier therefor.

4,451,462

METHOD OF TREATING INFLAMMATION AND PAIN USING HETERAMINO BENZOFURANS

Paul Wenk, Allschwil; Werner Breitenstein, and Marcus Baumann, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

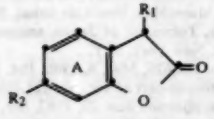
Continuation of Ser. No. 435,595, Oct. 21, 1982, Pat. No. 4,426,380. This application Oct. 17, 1983, Ser. No. 542,334

Claims priority, application Switzerland, Oct. 28, 1981, 6882/81

Int. Cl.³ A61K *31/445, 31/535*

U.S. Cl. 424—248.55 11 Claims

1. A method for treating inflammation and pain in warm-blooded animals comprising treating warm-blooded animals in need of such treatment with an effective amount of benzofuranones of the general formula



(I)

in which R_1 represents hydrogen or an aliphatic radical, R_2 represents an amino group di-substituted by a divalent hydrocarbon radical, and the aromatic ring A may be additionally substituted, and their salts and/or isomers.

4,451,463

ALCOHOL DERIVATIVES

Michael S. Large, Congleton, England, assignor to Imperial Chemical Industries PLC, London, England

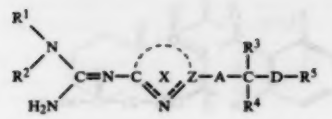
Filed Mar. 1, 1982, Ser. No. 353,416

Claims priority, application United Kingdom, Mar. 24, 1981, 8109217

Int. Cl.³ C07D *239/42, 239/34;* A61K *31/51*

U.S. Cl. 424—249 10 Claims

1. A guanidine derivative of the formula I:



I

in which R^1 and R^2, which may be the same or different, are hydrogen or branched or unbranched 1–10C alkyl, 3–8 C cycloalkyl or 4–14C cycloalkylalkyls, each alkyl, cycloalkyl or cycloalkylalkyl being optionally substituted by one or more halogens selected from fluorine, chlorine and bromine, provided that at least one of R^1 and R^2 is a halogen-substituted alkyl, cycloalkyl or cycloalkylalkyl, and provided that there is no halogen substituent on the carbon of the alkyl, cycloalkyl or cycloalkylalkyl which is directly attached to the nitrogen atom;

ring X is selected from pyrazine, pyridine, pyrimidine and 1,3,5-triazine and which ring may, where possible, carry one or two optional substituents, the optional substituents on ring X being selected from fluorine, chlorine, bromine, 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino;

—A— is a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyls and into which is optionally inserted, as part of the backbone of the chain, an NH or a 1–6C N-alkyl or one or two groups selected from oxygen, sulphur, cis and trans vinylene, ethynylene, phenylene and 5–7C cycloalkylene, provided that no two insertions selected from oxygen, sulphur, NH and N-alkyl are directly attached one to the other and provided that when the optional insertion is NH or N-alkyl, that insertion is directly attached to ring X, or —A— is 5–7C cycloalkylene; R^3 is hydrogen, 1–6C alkyl, 3–8C cycloalkyl, 4–12C cycloalkylalkyl, 3–6C alkenyl, 3–6C alkynyl or 2–8C alkoxyalkyl; R^4 is hydrogen or 1–6C alkyl; or A—CR^3R^4 is oxy-1,4-cyclohexylene; D is oxygen or sulphur; R^5 is hydrogen, 1–6C alkyl, 1–6C alkanoyl, phenyl, 7–11C phenylalkyl or benzoyl, the phenyl, penylalkyl and benzoyls each being optionally substituted by one or two substituents selected by one or two substituents selected from fluorine, chlorine, bromine, 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, cyano, trifluoromethyl, hydroxy and amino:

and the pharmaceutically-acceptable acid-addition salts thereof.

4,451,464
TRIFLUOROMETHYL SUBSTITUTED TRICYCLIC QUINAZOLINONES USEFUL AS TRANQUILIZERS

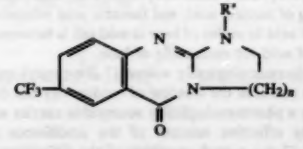
Goetz E. Hardtmann, Morristown, and William J. Houlihan, Mt. Lakes, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 401,649, Jul. 26, 1982, abandoned, which is a continuation of Ser. No. 302,486, Sep. 16, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,282

Int. Cl.³ A61K *31/505*; **C07D** *487/04*

U.S. Cl. 424—251 **19 Claims**

1. A compound of the formula:



wherein

R^* is alkyl of 1 to 8 carbon atoms, and

n is 1 to 2,

or a pharmaceutically acceptable acid addition salt thereof.

8. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and a tranquilizing effective amount of claim 1.

13. The method of tranquilizing a mammal comprising administering to a mammal a tranquilizing effective amount of a compound of claim 1.

4,451,465
ANTI-OBESITY AGENTS

Alan C. White, Windsor, and Michael G. Wyllie, Maidenhead, both of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

Filed Jun. 22, 1982, Ser. No. 391,071

Claims priority, application United Kingdom, Jul. 7, 1981, 8120961

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **3 Claims**

1. A method of treating or preventing obesity in mammals which comprises orally administering to a mammal in need thereof an amount effective to reduce weight gain or cause weight loss, as desired, in said mammal of 2,3,4,10-tetrahydro-3,3-dimethyl-10-phenylpyrimido[1,2-a]indole-10-ol or a pharmaceutically acceptable acid addition salt thereof.

4,451,466
USE OF PYRROLOQUINAZOLINEDIAMINES AS PESTICIDES

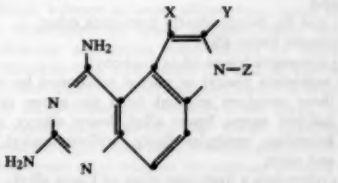
Charles A. Horne; Stephen A. Salvo; Kurt G. R. Sundelin, all of Modesto, Calif., and Steven A. Roman, Fulshear, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 2, 1982, Ser. No. 394,968

Int. Cl.³ A01N *43/54, 43/84, 43/86, 43/88*

U.S. Cl. 424—251 **1 Claim**

1. A method for protecting plants from insects which feed upon the foliage of plants, which comprises applying to the foliage of a plant to be protected an amount effective to either kill the insects or to cause the insects to stop feeding of a compound of the formula:



(I)

and acid addition salts thereof, wherein

(A) X is hydrogen, Y is hydrogen, halogen, alkyl of from one to six carbon atoms, or phenyl, and

Z is one of

(i) hydrogen;

(ii) straight-chain or branched-chain alkyl of up to eight carbon atoms;

(iii) a moiety R— or R—A—, wherein A is alkylene of from one to three carbon atoms with from one to two carbon atoms in the linking chain, and R is one of

(a) phenyl; naphthalenyl;

(b) phenyl substituted by alkanoyl of from two to six carbon atoms, aminocarbonyl, alkoxycarbonyl of from two to six carbon atoms, alkylsulfonyl of from one to three carbon atoms, or by from one to four substituents selected from halogen; nitro; amino; cyano; trifluoromethyl; trifluoromethoxy; or alkyl, alkoxy and alkylthio of from one to four carbon atoms each;

(c) pyridinyl, thienyl, thiazolyl, isoxazolyl, quinolyl, pyrimidinyl, pyrazinyl, quinoxalinyl, or any of these substituted by from one to three substituents selected from halogen, nitro, trifluoromethyl, phenyl, and alkyl of from one to four carbon atoms; 1-benzo[b]-thienyl;

(iv) cycloalkyl of from three to six carbon atoms;

(v) phenylsulfonyl or phenylsulfonyl substituted by from one to three substituents selected from halogen, and alkyl of from one to four carbon atoms;

(B) X and Y together represent an alkylene moiety of from one to four carbon atoms, which may be substituted by one to three substituents selected from halogen, alkyl, alkoxy and alkylthio of from one to six carbon atoms, and Z is as defined in (A).

4,451,467

4(3H)-QUINAZOLINONE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF, AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAID COMPOUNDS

Masayuki Ishikawa, 14-13, Akazutsumi 3-chome, Setagaya-ku, Tokyo, Japan; Yukuo Eguchi, Chiba, Japan; Soyao Moriguchi, Yokohama, Japan, and Hisashi Ebisawa, Chofu, Japan, assignors to Masayuki Ishikawa, Tokyo, Japan

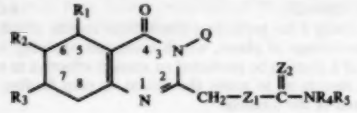
Filed Jan. 6, 1982, Ser. No. 337,454

Claims priority, application Japan, Jan. 16, 1981, 56-3904; Aug. 4, 1981, 56-121379; Sep. 18, 1981, 56-146301

Int. Cl.³ A61K *31/505;* **C07D** *401/12, 239/90*

U.S. Cl. 424—251 **19 Claims**

1. A 4(3H)-quinazolinone compound of the formula (I)



(I)

wherein

R_1 and R_3, independently from each other, represent lower alkyl;

R_2 represents lower alkoxycarbonyl;

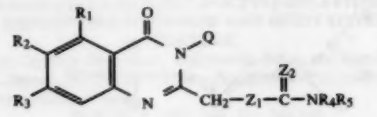
Q represents phenyl or phenyl substituted by one, two or three members selected from the group consisting of halogen atoms, lower alkyl, lower alkoxy, di(lower)alkylamino, methylenedioxy, trifluoromethyl, hydroxyl, and nitro;

R_4 represents a hydrogen atom or lower alkyl;

R_5 represents a member selected from the group consisting of a hydrogen atom, cyclohexyl cyclohexymethyl alkyl, lower, lower halogenoalkyl, lower alkenyl, cyclohexenyl, (lower)alkoxy(lower)alkyl, hydroxy(lower)alkyl, (lower-)alkylthio(lower)alkyl, (lower)alkylsulfinyl(lower)alkyl, (lower)alkylsulfonyl(lower)alkyl, di(lower)alkylamino(-lower)alkyl, benzyl, phenethyl, pyridyl(lower)alkyl, furfuryl, phenyl, and phenyl substituted by a member selected from the group consisting of halogen atoms, lower alkyl, and lower alkoxy; and

Z_1 and Z_2, independently from each other, represent an oxygen or sulfur atom; and the pharmaceutically acceptable acid addition salts thereof.

19. A pharmaceutical composition suitable for the treatment of hypotension composed of an effective amount of a 4(3H)-quinazolinone compound and a pharmaceutically acceptable diluent or carrier, said 4(3H)-quinazolinone compound being selected from the group consisting of the compounds of the following formula



(I)

wherein

R_1 and R_3, independently from each other, represent lower alkyl;

R_2 represents lower alkoxycarbonyl;

Q represents phenyl or phenyl substituted by one, two or three members selected from the group consisting of halogen atoms, lower alkyl, lower alkoxy, di(lower)alkylamino, methylenedioxy, trifluoromethyl, hydroxyl, and nitro;

R_4 represents a hydrogen atom or lower alkyl;

R_5 represents a member selected from the group consisting of a hydrogen atom, lower alkyl, cyclohexyl, cyclohexymethyl, halogenoalkyl, lower alkenyl, lower cyclohexenyl (lower)alkoxy(lower)alkyl, hydroxyl(lower)alkyl, (lower)alkylthio(lower)alkyl, (lower)alkylsulfinyl(lower-)alkyl, (lower)alkylsulfonyl(lower)alkyl, di(lower)alkylamino(lower)alkyl, benzyl, phenetyl, pyridyl(lower)alkyl, furfuryl, phenyl, and phenyl substituted by a member selected from the group consisting of halogen atom, lower alkyl, and lower alkoxy; and

Z_1 and Z_2, independently from each other, represent an oxygen or sulfur atom and the pharmaceutically acceptable acid addition salts thereof.

4,451,468

ACIDIFEROUS 17-NORMAL-PENTYL SPARTEINE TARTARIC AND FUMARIC ACID SALTS PHARMACEUTICAL COMPOSITIONS THEREOF

Bernd Hachmeister, Hanover; Wolfgang Milkowski, Burgdorf; Ulrich Kühl, Hanover; Gerd Buschmann, Hanover, and Renke Budden, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 103,077, Dec. 12, 1979, abandoned.

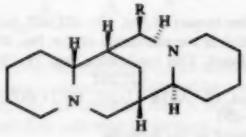
This application Sep. 30, 1981, Ser. No. 307,189

Claims priority, application European Pat. Off., Sep. 6, 1979, EP 79103315.2

Int. Cl.³ A61K *31/435;* **C07D** *471/22*

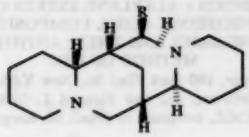
U.S. Cl. 424—256 **7 Claims**

1. An acidiferous acid addition salt of 17-β-n-pentyl sparteine of the following formula:



wherein R is n-pentyl and a dicarboxylic acid selected from the group consisting of tartaric acid, and fumaric acid wherein the ratio of moles of acid to moles of base in said salt is between 2.1 and 3.5 moles of acid for each mole of base.

5. A stable, pharmacologically active 17-β-n-pentyl sparteine composition useful in the treating of cardiac rhythm disorders comprising a pharmacologically acceptable carrier and a pharmaceutically effective amount of the acidiferous acid addition salt of 17-β-n-pentyl sparteine of the following formula:



wherein R is n-pentyl and a dicarboxylic acid selected from the group consisting of tartaric acid, and furmaric acid wherein the ratio of moles of acid to moles of base in said salt is between 2.1 and 3.5 moles of acid for each mole of base.

4,451,469

SELECTED 6-ALKYL-AND 4,6-DIALKYL-2(1H)-PYRIDINONES AS CARDIOTONICS

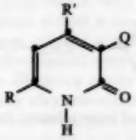
Baldev Singh, East Greenbush, and George Y. Lesher, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,261

Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 **10 Claims**

1. A cardiotonic composition for increasing cardiac contractility, said composition comprising a pharmaceutically acceptable inert carrier and, as the active component thereof, a cardiotonically effective amount of 3-Q-4-R'-6-R-2(1H)pyridinone having the formula



where Q is hydrogen or cyano, R' is hydrogen, methyl, ethyl or n-propyl, and R is methyl, ethyl or n-propyl.

4,451,470

ANALGESIC, ANTAGONIST, AND/OR ANORECTIC 14-FLUOROMORPHINANS

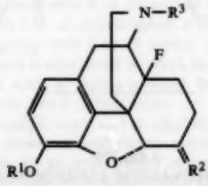
Venkat Ganti, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 6, 1982, Ser. No. 395,597

Int. Cl.³ A61K *31/485*; C07D *489/06*

U.S. Cl. 424—260 **8 Claims**

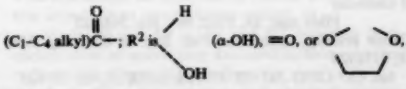
1. A compound having the formula:



I

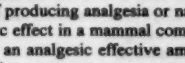
wherein

R^1 is —H, —CH_3 or



or (O—C_1 to C_6 alkyl)$_2$; and

R^3 is C_1–C_5 alkyl,



allyl or 3,3-dimethylallyl;

or a pharmaceutically suitable salt thereof.

7. A pharmaceutical composition consisting essentially of a suitable pharmaceutical carrier and an effective analgesic amount or antagonist amount or anorexigenic amount of a compound of claim 1, or claim 2, or claim 3, or claim 4, or claim 5, or claim 6.

8. A method of producing analgesia or narcotic withdrawal or an anorexigenic effect in a mammal comprising administering to a mammal an analgesic effective amount or a narcotic antagonist effective amount or an anorexigenic effective amount of a compound of claim 1, or claim 2, or claim 3, or claim 4, or claim 5, or claim 6.

4,451,471

CERTAIN 2,4,5-TRI-SUBSTITUTED THIAZOLES, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND METHODS OF USING SAME

Pier G. Ferrini, Binningen, and Richard Göschke, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

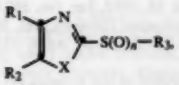
Filed Mar. 8, 1982, Ser. No. 355,989

Claims priority, application Switzerland, Mar. 18, 1981, 1838/81

Int. Cl.³ C07D *417/04*; A61K *31/44*

U.S. Cl. 424—263 **26 Claims**

1. A novel 2,4,5-trisubstituted thiazole of the formula



(I)

in which at least one of the radicals R_1 and R_2 represents optionally N-oxidised pyridyl and the other represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy, halogen or lower alkanoyloxy, lower alkylthio, lower alkanesulphinyl, lower alkanesulphonyl, amino, mono- or di-lower alkylamino, nitro and/or by trifluoromethyl, X represents thio, n represents 0, 1 or 2, R_3 represents lower alkyl, lower alkenyl or lower alkynyl, mono- or di-lower alkoxy-lower alkyl, lower alkylenedioxy-lower alkyl, lower alkanoyloxy-lower alkyl carrying the lower alkanoyloxy group in a position higher than the α-position, polyhalo-lower alkyl, hydroxy-lower alkyl wherein the hydroxy group is at a position higher than the α-position, oxo-lower alkyl carrying the oxo group in a position higher than the α-position, or phenyl-lower alkyl that is unsubstituted or substituted as indicated for R_1 and R_2, or a pharmaceutically acceptable salt thereof.

4,451,472

INHIBITION OF THROMBOXANE SYNTHETASE WITH 3-(HETEROALKYL)-INDOLYL-ACRYLIC ACID DERIVATIVES

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

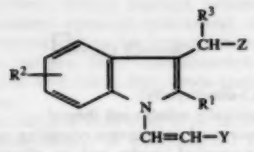
Filed Jul. 2, 1982, Ser. No. 394,554

Claims priority, application United Kingdom, Jul. 7, 1981, 8120878; May 13, 1982, 8213864

Int. Cl.³ A61K *31/415*; C07D *403/06*

U.S. Cl. 424—263 **15 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition or base salt thereof, wherein

R^1 is hydrogen or alkyl of 1–4 carbon atoms;

R^2 is hydrogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms or halogen;

R^3 is hydrogen or methyl;

Y is carboxy, carbalkoxy having 1–4 carbon atoms in the alkyl group or carboxamido; and

Z is 1-imidazolyl or 3-pyridyl.

4,451,473

3,7-DIAZABICYCLO [3.3.1] NONANES HAVING ANTI-ARRHYTHMIC ACTIVITY

Károly Nádor; Gábor Kraiss; Katalin Sinkó; Margit Paroczai; Egon Kárpáti, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

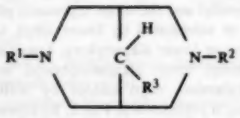
Filed Jul. 16, 1982, Ser. No. 398,801

Claims priority, application Hungary, Jul. 20, 1981, 2112/81

Int. Cl.³ C07D *471/08;* A61K *31/44*

U.S. Cl. 424—256 **11 Claims**

1. A bicyclic compound of the formula (I)



wherein

R^1 and R^2 are each C_{1-6} alkyl and

R^3 is an etherified hydroxy group of the formula —OR^4, wherein

R^4 is benzyl, benzhydryl or phenyl which can have a phenyl or a trihalomethyl substituent or a halogen substituent, or

R^3 is an esterified hydroxy group of the formula —O-CO—R^5 selected from the group which consists of:

a phenyl-(C_1-5 alkyl)-carbonyloxy group,

a cinnamoyloxy group which can have a halogen or one to three C_{1-4} alkoxy substituents,

a benzoyloxy group which can have a C_{1-4} alkyl, phenyl or trihalomethyl substituent or one or two C_{1-4} alkoxy substituents, one or two halo substituents and/or a nitro substituent,

a benzyloyloxy group,

a xanthene-9-carbonyloxy group,

a naphthoyloxy group, or a thenoyloxy, nicotinoyloxy, or furoyloxy group each of which can have a halo substituent on the ring,

or a stereoisomer or a pharmaceutically acceptable acid addition salt thereof.

4,451,474

T-BUTYL-PHENOXY-ALKYLENE ESTERS OF BENZOIC AND NICOTINIC ACIDS, COMPOSITIONS CONTAINING SAME AND THEIR ANTIHISTAMINIC METHOD OF USE

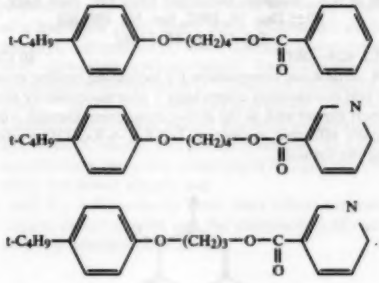
Frank M. Berger, 190 East 72nd St., New York, N.Y. 10031; Joseph I. DeGraw, Jr., and Howard L. Johnson, both of Sunnyvale, Calif., assignors to Frank M. Berger, New York, N.Y.

Continuation-in-part of Ser. No. 114,183, Jan. 22, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 327,141

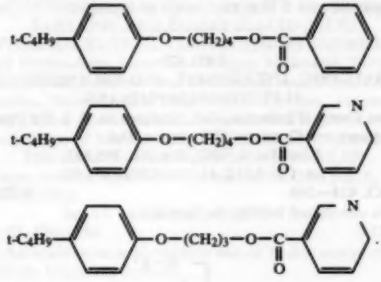
Int. Cl.³ C07D *213/55;* C07C *69/78;* A61K *31/455*

U.S. Cl. 424—266 **11 Claims**

5. A method for the antihistaminic treatment of animals in need of said treatment which comprises administering to the animal an amount therapeutically effective as an antihistamine of a p-alkyl phenoxy alcohol ester selected from the group consisting of:



8. A phenoxy alkanol ester selected from the group consisting of:



4,451,475

CYCLIC SULPHENAMIDE COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Wolf-Dieter Busse, Wuppertal; Edmund Krauthausen, Cologne, and Mithat Mardin, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

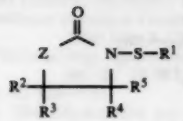
Filed Apr. 14, 1982, Ser. No. 368,329

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118129

Int. Cl.³ C07D *263/22, 277/14;* A61K *31/42, 31/425*

U.S. Cl. 424—270 **18 Claims**

1. A compound which is a sulphenamides of the formula

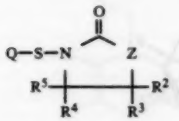


(I)

wherein

Z denotes oxygen or sulphur,

R^1 represents a radical of the general formula



(Ia)

wherein

Z has the abovementioned meaning and

R^1 to R^5 have the meanings given below, and

Q represents an alkylene radical with 1 to 12 carbon atoms, in which the alkylene radical is optionally interrupted by one or more oxygen, sulphur or nitrogen atoms, or represents a cycloalkylene radical with 5 to 12 carbon atoms, arylene with 6 to 10 carbon atoms or an alkylene-cycloalkylene-alkylene or alkylene-arylene-alkylene radical, or

R^1 represents an alkenyl or alkynyl group with 2 to 12 carbon atoms, an aralkyl group with 7 to 11 carbon atoms, a cycloalkyl group with 5 to 8 carbon atoms or an aryl group with 6 to 14 carbon atoms; each of the abovementioned groups optionally being substituted by up to 5 identical or different substituents selected from alkoxy, alkyl, aralkyl, cycloalkyl, aryl, aryloxy, arylthio, alkylthio, carboxyl, carbalkoxy, cyano, carbamoyl, sulphonyl, halogenoalkyl, halogenoalkoxy, halogen, amino and amino by C_1–C_4-alkyl or benzyl, and

each R^2 and R^5 represent, independently of each other, a hydrogen atom, an alkyl group with 1 to 8 carbon atoms, a cycloalkyl group, with 5 to 8 carbon atoms, an aralkyl group with 7 to 10 carbon atoms, an aryl group with 6 or 10 carbon atoms, an alkoxy group with 1 to 12 carbon atoms, an aralkoxy group with 7 to 10 carbon atoms, an aryloxy group with 6 or 10 carbon atoms, an alkylthio group with 1 to 12 carbon atoms, a benzylthio group, an arylthio group with 6 or 10 carbon atoms, or an amino group which is substituted by alkyl, benzyl and/or aryl, or

R^2 together with R^4 forms a direct bond or an alkylene radical with 3 to 6 carbon atoms, or

R^2 and R^3 together represent an alkylidene radical with 1 to 4 carbon atoms, an aralkylidene radical with 7 to 10 carbon atoms, or an oxo, thiono or imino radical, or the radicals R^2 and R^3, together with the carbon atoms to which they are bonded, form a cycloalkyl radical with 5 to 8 ring members, or

R^4 and R^5 together represent an alkylidene radical with 1 to 4 carbon atoms, an aralkylidene radical with 7 to 10 carbon atoms, or an oxo or imino radical, or

the radicals R^4 and R^5 or R^2 and R^3, together with the carbon atom to which they are bonded, form a cycloalkyl radical with 5 to 8 ring members, or

the radicals R^2 to R^5, together with the carbon atoms to which they are bonded, form an, fused-on benzene ring.

4,451,476

ISOXAZOLES AS ANTIVIRAL AGENTS

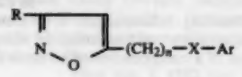
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,060, Dec. 13, 1982, abandoned. This application Oct. 17, 1983, Ser. No. 542,871

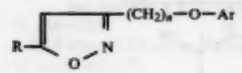
Int. Cl.³ A61K *31/42*; C07D *261/08*

U.S. Cl. 424—272 **20 Claims**

1. A compound having the formula



or



wherein:

R is alkyl of 1 to 3 carbon atoms;

X is O or CH_2;

n is an integer from 4 to 8; and

Ar is phenyl or phenyl substituted by one or two substituents selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, nitro, cyano, carboxy, lower-alkoxycarbonyl, lower-alkanoyl, 1-oximino-lower-alkyl, hydrazinocarbonyl, carbamyl and N,N-di-lower-alkylcarbamyl.

4,451,477

BENDAZAC TREATMENT OF CATARACT

Bruno Silvestrini, and Leandro Baiocchi, both of Rome, Italy, assignors to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy

Filed Jun. 8, 1982, Ser. No. 386,468

Claims priority, application Italy, Nov. 27, 1981, 49790 A/81

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 N **11 Claims**

1. A method for the treatment of cataracts in a human comprising administering to said human a therapeutically effective amount of bendazac.

4,451,478

IMIDAZOLE COMPOUNDS

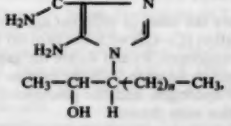
Lionel N. Simon, Santa Ana, Calif.; Hans-Rudolf Mueller, Beckenwaildli, and Hans Zutter, Stauffacherstrasse, both of Switzerland, assignors to Newport Pharmaceuticals International, Inc., Newport Beach, Calif.

Filed Mar. 12, 1982, Ser. No. 357,679

Int. Cl.³ C07D *231/10*; A61K *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A compound having the formula



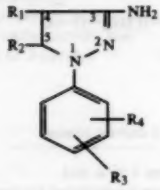
(I.)

4,451,479
THERAPEUTICALLY ACTIVE 3-AMINO-1-HALOGENATED PHENYL-2-PYRAZOLINES AND THEIR C4 AND C5 ANALOGS

John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 282,700, Jul. 13, 1981, abandoned. This application Oct. 4, 1982, Ser. No. 432,607
Int. Cl.³ A61K *31/415*; A01N *43/56*; C07D *231/06*
U.S. Cl. 424—273 P 58 Claims

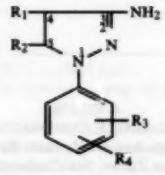
1. A method of meliorating inflammation in a mammal which comprises administering to said mammal an effective anti-inflammatory amount of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is phenyl or

where R_5 and R_6 are the same or different and are hydrogen, halogen or lower alkyl (C_1–C_4) with the proviso that R_5 and R_6 cannot both be hydrogen; R_3 and R_4 are the same or different and are hydrogen or halogen with the proviso that R_3 and R_4 cannot both be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

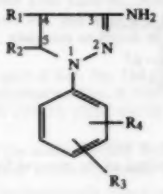
13. A method of treating bacterial and/or fungal infections in a mammal which comprises administering to said mammal an effective antibacterial and/or antifungal amount of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is hydrogen, lower alkyl (C_1–C_4), phenyl or

where R_5 and R_6 are the same or different and are hydrogen, halogen or lower alkyl (C_1–C_4) with the proviso that R_5 and R_6 cannot both be hydrogen; R_3 and R_4 are the same or different and are hydrogen or halogen with the proviso that R_3 and R_4 cannot both be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

58. A method of preventing the onset of asthmatic symptoms or allergic diseases in a mammal which comprises administering to said mammal an effective prophylactic amount for the prevention of asthmatic symptoms or allergic diseases of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is phenyl or

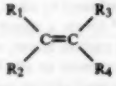
where R_5 and R_6 are the same or different and are hydrogen, halogen or lower alkyl (C_1–C_4) with the proviso that R_5 and R_6 cannot both be hydrogen; R_3 and R_4 are the same or different and are hydrogen or halogen with the proviso that R_3 and R_4 cannot both be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,451,480
METHOD OF TREATING ACNE USING OZONIZED MATERIALS

Richard L. DeVillez, New Braunfels, Tex., assignor to James Howard Brown, Scottsdale, Ariz.

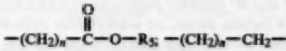
Filed Apr. 16, 1982, Ser. No. 369,163
Int. Cl.³ A61K *31/335*
U.S. Cl. 424—278 5 Claims

1. A method for treating acne which comprises applying topically to an affected area an effective amount of an ozonide of fixed oils, esters, fatty acids, alcohols and ethers containing an olefin of the general formula;



wherein: R_3 and/or R_4 may by hydrogen or:

$-(CH_2)_n-CH_3$; $-(CH_2)_n-CH_2OH$; $-(CH_2)_n-COOH$;



where $R_5=(CH_2)_n-CH_3$ and n=an integer from 0 to 12; with R_1 and R_2 being any value given for R_3 and R_4 with the proviso that R_1 and R_2 cannot both equal H and also R_3 and R_4 cannot both equal H.

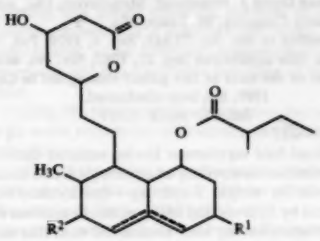
4,451,481

M-4 AND ISOM-4 DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Akira Terahara, and Minoru Tanaka, both of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

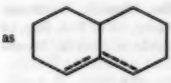
Filed May 5, 1982, Ser. No. 375,333
Claims priority, application Japan, May 11, 1981, 56-70497
Int. Cl.³ C07D *309/30;* A61K *31/365*
U.S. Cl. 424—279 6 Claims

1. The dihydro-M-4 and dihydro-isoM-4 lactones of the formula (I):



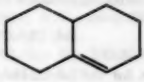
(I)

wherein one of R^1 and R^2 represents a hydrogen atom and the other represents a hydroxy group and wherein the structure shown

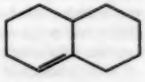


as represents

a structure of formula



or



4,451,482

METHOD OF PREVENTING OR AMELIORATING PYRETHROID SKIN SENSORY STIMULATION

Stuart Z. Cagen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 22, 1982, Ser. No. 371,023
Int. Cl.³ A01N *43/16;* A61K *31/355*
U.S. Cl. 424—284 11 Claims

1. A method of preventing or ameliorating pyrethroid skin sensory stimulation and associated enhanced sensitivity to other stimulation which comprises applying to the skin of a human or an animal a composition comprising an effective amount of α-tocopherol or ester thereof optionally in a pharmaceutically-acceptable carrier.

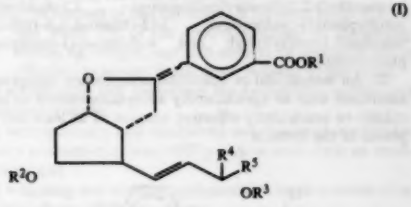
4,451,483

2,3,4-TRINOR-M-INTER-PHENYLENE-PROSTAGLANDIN DERIVATIVES AND COMPOSITIONS AND METHOD FOR INHIBITING BLOOD PLATELET AGGREGATION

István Székely, Dunakeszi; Krisztina Kékesi, Debrecen; Mariann Lovász neé Gáspár, Budapest; Sandor Botár, Budapest; Pál Hadházy, Budapest; István Rákóczi, Budapest; László Muszbek, Bebrecen; Judit Skopál, Budapest; István Stadler, Budapest; Károly Horváth, Budapest; Gábor Kovács, Budapest, and Peter Körmöczy, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Apr. 9, 1982, Ser. No. 367,068
Claims priority, application Hungary, Apr. 14, 1981, 962/81; Apr. 14, 1981, 963/81; Apr. 14, 1981, 964/81
Int. Cl.³ A61K *31/34;* C07D *307/935*
U.S. Cl. 424—285 24 Claims

1. A 2,3,4-trinor-1,5-inter-m-phenylene-prostacycline derivative of the formula (I)



(I)

wherein

R^1 is hydrogen, C_{1-4}alkyl, an alkali metal cation or a primary, secondary, tertiary or quaternary ammonium cation, R^2 and R^3 each are hydrogen or C_{1-4}alkanoyl, benzoyl, tetrahydropyranyl, ethoxyethyl or tri-(C_{1-4}alkyl)-silyl,

R^4 is hydrogen or C_{1-4} alkyl, and

R^5 is hexyl, heptyl, phenoxymethyl or m-trifluoromethyl-phenoxymethyl, or

R^5 represents a group of the formula

and

Z is amino, or unsubstituted or halo-substituted C_{1-4} alkanoylamino, benzoylamino or tosylamino, and

R^6 is C_{4-6}alkyl, phenyl or benzyl.

24. A method of inhibiting blood platelet aggregation in a susceptible subject which comprises administering to said subject an effective amount of a compound as defined in claim 1.

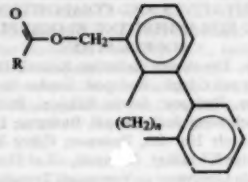
4,451,484

INSECTICIDAL 2,2'-BRIDGED[1,1'-BIPHENYL]-3-YLMETHYL ESTERS

Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

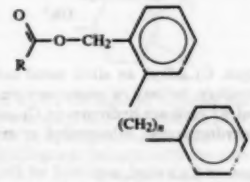
Continuation-in-part of Ser. No. 259,111, Apr. 30, 1981, abandoned. This application Apr. 15, 1982, Ser. No. 368,608
Int. Cl.³ C07C *69/743, 69/747;* A01N *53/00*
U.S. Cl. 424—305 35 Claims

1. Insecticidal and acaricidal 2,2'-bridged[1,1'-biphenyl]-3-ylmethyl pyrethroid esters of the formula



wherein n is 1–4 and R is selected from 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropyl; 3-(cyclopentylidenemethyl)-2,2-dimethylcyclopropyl; 3-(2-methyl-1-propenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(3-chloro-2,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(2,3-dichloro-3,3-difluoro-1-propenyl)-2,2-dimethylcyclopropyl; 2,2,3,3-tetramethylcyclopropyl; 2,2-dichloro-3,3-dimethylcyclopropyl; 3-(1,2,2,2-tetrabromoethyl)-2,2-dimethylcyclopropyl; 2,2-dichloro-1-(4-ethoxyphenyl)-cyclopropyl; 2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methylbutyl; and 4-chloro-α-(1-methylethyl)-phenylmethyl.

25. An insecticidal or acaricidal composition comprising in admixture with an agriculturally acceptable carrier an insecticidally or acaricidally effective amount of at least one compound of the formula



wherein n is 1–4 and R is selected from 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropyl; 3-(cyclopentylidenemethyl)-2,2-dimethylcyclopropyl; 3-(2-methyl-1-propenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(3-chloro-2,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(2,3-dichloro-3,3-difluoro-1-propenyl)-2,2-dimethylcyclopropyl; 2,2,3,3-tetramethylcyclopropyl; 2,2-dichloro-3,3-dimethylcyclopropyl; 3-(1,2,2,2-tetrabromoethyl)-2,2-dimethylcyclopropyl; 2,2-dichloro-1-(4-ethoxyphenyl)-cyclopropyl; 2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methylbutyl; and 4-chloro-α-(1-methylethyl)-phenylmethyl.

4,451,485

TREATMENT OF CARDIO-VASCULAR DISEASES WITH 3-(2,2,2-TRIMETHYLHYDRAZINIUM) PROPIONATE DIHYDRATE

Ivars Y. Kalvinsh, poselok Salaspils; Alexei V. Vinogradov, Moscow; Maris M. Veveris, Riga; Inna I. Makarova, Moscow; Anatoly S. Birman, Riga; Georgy V. Barmotin, Moscow, and Oleg N. Akifiev, Riga, all of U.S.S.R., assignors to Institu Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR, Riga, U.S.S.R.

Filed Sep. 17, 1982, Ser. No. 419,454

Claims priority, application U.S.S.R., Sep. 17, 1981, 3374766

Int. Cl.³ A61K *31/205*

U.S. Cl. 424—316 **4 Claims**

1. A method of treating cardiovascular disease in warm blooded animals comprising administering to said warm blooded animals an effective amount of a composition possessing antiarrhythmic and antianginal activity which comprises the compound 3-(2,2,2-trimethylhydrazinium)propionate dihydrate having the formula:

$$(CH_3)_3N^+NHCH_2CH_2COO^- .2H_2O$$

and a pharmaceutically acceptable diluent.

4,451,486

ANIMAL FEED SUPPLEMENT HAVING REDUCED CORROSION CHARACTERISTICS

Joseph W. Baker, St. Louis, Mo.; Dennis L. Mansfield, Nitro, W. Va., and David J. Weinkauff, Manchester, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 72,541, Sep. 4, 1979, Pat. No. 4,353,924. This application Sep. 27, 1982, Ser. No. 466,750

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 **6 Claims**

1. An animal feed supplement having reduced metal corrosion characteristics comprising an aqueous solution containing 87–90 percent by weight 2-hydroxy-4-(methylthio)-butanoic acid prepared by hydrolyzing MHA-nitrile in aqueous mineral acid, said solution having been neutralized such that said supplement contains essentially no free mineral acid.

4,451,487

PROCESS FOR THE PURIFICATION OR ENRICHMENT OF BIOLOGICALLY ACTIVE PROTEINS

Heilmuth Vetter, Tutzing; Peter Scheibe, Munich; Waldemar Thum, and Gotthilf Näher, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH., Mannheim, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,277

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119453

Int. Cl.³ C12N *9/00*

U.S. Cl. 435—183 **11 Claims**

1. Process for the purification or enrichment of a biologically active protein which process comprising mixing an aqueous solution containing the protein at a pH value below its isoelectric point with an arylsulphonic acid azo dyestuff having two sulphonate groups separated from one another by 8 to 10 double bonds in a resonance relationship, including at least one N=N double bond, in sufficient amount result in precipitation of at least the major part of the biological activity of the desired active protein, separating off the precipitate, and bringing the active protein again into solution at a pH value above its isoelectric point.

4,451,488

FOOD BAR

Milton L. Cook, Algonquin; William L. Keyser, East Dundee; Paul Swanson, Crystal Lake, all of Ill.; Michael W. Zielke, Lowell, Mich., and Walter J. Zielinski, Ingleside, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 276,393, Jun. 22, 1981, abandoned, Continuation-in-part of Ser. No. 233,382, Jun. 22, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 510,474

Int. Cl.³ A23L *1/10, 1/34*

U.S. Cl. 426—89 **10 Claims**

1. In a, dry, ready to eat food bar of the type containing (a) a mixture of dry ingredients selected from the group consisting of grains, fruits, nuts, chocolate chips, and vegetables; (b) flavorings and salt; (c) antioxidant; (d) shortening; (e) sugar; and (f) at least about 3% glycerol; and having a moisture content in the range 4–8%, a water activity between about 0.2 to about 0.55 and a soft chewy texture, the improvement wherein:

sorbitol is present in a ratio 1:1 to 1:5, based on the weight of the glycerol, to mask the bitter flavor of the glycerol.

4,451,489

SUGAR BEET PULP BULKING AGENT AND PROCESS

Robert J. Beale, New Rochelle; Allen G. W. Bradbury, Tarrytown; Darrell G. Medcalf, Chappequa, and William R. Romig, Yorktown Heights, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,406
Int. Cl.³ A23L *1/277*
U.S. Cl. 426—254 20 Claims

1. A process for producing a sugar beet pulp bulking agent from peeled whole sugar beet slices or particles, or spent sugar beet cossettes which comprises:

(a) placing said peeled cossettes, particles or slices into a stabilizer solution of a water-soluble sulfite, bisulfite or metabisulfite in an effective concentration to prevent enzymatic and non-enzymatic darkening of the sugar beet pulp;

(b) washing the thusly stabilized cossettes, particles or slices with water to remove substantially all of the soluble carbohydrates;

(c) contacting the water-washed cossettes, particles or slices with an alcoholic solution to remove substantially all of the color and flavor constituents; and

(d) removing water and alcohol from said cossettes, particles or slices to produce a bland, decolorized and odorless sugar beet pulp bulking agent.

4,451,490

HIGH QUALITY, REDUCED-CALORIE CAKE CONTAINING CELLULOSE AND PROCESS THEREOF

Jerry E. Silverman, Hamilton Square, N.J.; John R. Frost, Beacon, N.Y.; Elizabeth Hegedus, Tarrytown, N.Y., and Martin Glicksman, Valley Cottage, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,403
Int. Cl.³ A21D *13/08*
U.S. Cl. 426—553 12 Claims

1. A cake comprising: 40–65% water, 5–30% cake flour, 0–25% sugar, 1–6% shortening, 0–10% egg white solids, 0.5–6% leavening agent, 0–2% emulsifier, 2–20% cellulose flour, and 0–5% gum, and less than 2.0 calories per gram.

4,451,491

MIX FOR THE PREPARATION OF BREAD AND CAKE PRODUCTS

Moshe Trop, and Avinoam Livne, both of Beer Sheva, Israel, assignors to Ben-Gurion University of The Negev Research and Development Authority, Israel

Filed Jul. 27, 1981, Ser. No. 287,179
Claims priority, application Israel, Jul. 28, 1980, 60685
Int. Cl.³ A21D *10/00*
U.S. Cl. 426—555 8 Claims

1. A mix for the preparation of bread and cake products comprising a non-wheat-based starch, a gluten-substitute gum, and an emulsified-fat, powdered whipping agent, said non-wheat-based starch being present in an amount of about 50 to 80 wt. % of said mix, said gluten-substitute gum being present in sufficient amount to create viscosity in and form a coherent dough system upon the addition of water, and able to retain leavening gas formed during preparation of said dough; and said whipping agent being present in sufficient amounts to propagate seeding cells in a dough formed from said mix, and also increase the gas retention properties of the dough, and wherein said products are produced in the substantial absence of wheat flour.

4,451,492

REAL CREAM FROZEN WHIPPED TOPPING COMPOSITION

William J. Dell, Howell, N.J.; Alexander A. Gonsalves, Yardley, Pa.; William E. Flango, Hamilton Square, N.J.; Thomas E. Guhl, Jamesburg, N.J.; Lawrence H. Freed, Plainsboro, N.J.; John T. Oppy, Allentown, N.J.; Suzanne Baratta, Plainsboro, N.J., and Andre J. Eydt, New York, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,283
Int. Cl.³ A23C *13/14;* A23G *9/00*
U.S. Cl. 426—564 8 Claims

1. A process for making a freeze-thaw stable, edible foam comprising the steps of:

(a) adding a dairy ingredient comprising milk fat to a mixing vessel;

(b) adding a food approved, calcium chelating salt to the mixing vessel, wherein said salt:

(i) is essentially free of calcium;

(ii) is the salt of a phosphorous oxyacid;

(iii) has a pK_a between 2 and about 9;

(iv) the amount of said salt added is between about 0.001% and about 1% of the total ingredients in the mixing vessel, by weight, and said amount of chelating salt is effective to impart freeze-thaw stability to the foam;

(c) solubilizing and dispersing the ingredients within said mixing vessels;

(d) homogenizing said solubilized and dispersed ingredients at a pressure of at least 6000 p.s.i.g. so as to form an emulsion; and

(e) whipping and aerating said emulsion to an overrun of at least about 150% by volume.

4,451,493

SALAD DRESSINGS OF THE SEPARATING TYPE

Donald E. Miller, Strongsville, and Charles E. Werstak, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 356,258
Int. Cl.³ A23L *1/24;* A23D *5/00, 5/02*
U.S. Cl. 426—602 8 Claims

1. A packaged, flavored, non-homogenized oil-and-water salad dressing of the separating type, which has improved limited stability during usage upon hand shaking of the salad dressing yet reverts to phase separation after use of such dressing, comprising in parts by weight;

about 30–80 parts water;

about 20–70 parts of a normally liquid hydrogenated vegetable oil;

flavoring amounts of water or oil soluble or dispersible salad dressing flavor components; and

an emulsifying amount of a food grade polyglycerol ester emulsifier having an HLB value in the range of about 10–16, said emulsifying amount being sufficient to achieve said improved limited stability, said amount of polyglycerol ester being less than a flavoring amount.

4,451,494

SODIUM-FREE SALT SUBSTITUTE

Charles F. Roan, III, Rte. 1, Box 722, Lake Geneva, Wis. 53147

Filed Sep. 10, 1982, Ser. No. 416,631
Int. Cl.³ A23L *1/237*
U.S. Cl. 426—649 10 Claims

1. An edible, substantially sodium-free salt substitute composition which comprises: (a) from about 0.1% to about 2% by weight of hydrolyzed collagenous animal protein having an average molecular weight of from about 500 to about 5000, an amino nitrogen content of from about 1% to about 2% and a total nitrogen content of from about 15% to about 17%, and (b) from about 98% to about 99.9% by weight of potassium chloride.

4,451,495

INCREASING MAGNETIC PARTICLE CONCENTRATION IN MAGNETIC COATINGS

Andrew M. Homola, Morgan Hill; Max R. Lorenz, San Jose, and Heinrich Sussner, Monte Sereno, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,675
Int. Cl.³ B05D 1/06, 5/12
U.S. Cl. 427—27 4 Claims

1. A method for applying a magnetic coating to a substrate comprising the steps of:

coating said substrate with an active coating material having an electrostatic charge to form an active layer,

applying a coating of colloidal silica particles on magnetic particles, said silica-coated magnetic particles being dispersed in an electrolyte, said electrolyte containing sodium chloride,

adjusting the concentration of said electrolyte in said dispersion to reduce the coulombic repulsive forces between adjacent silica-coated magnetic particles to permit closer spacing between said particles,

and applying said coated magnetic particles to said active layer,

said silica-coated magnetic particles having an electrostatic charge thereon opposite to the charge on said active coating material, whereby said silica-coated magnetic particles are electrostatically attracted to and bonded to said active material to form a magnetic layer,

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4,451,496

COATING WITH OVERLAY METALLIC-CERMET ALLOY SYSTEMS

Michael A. Gedwill, North Olmsted; Stanley R. Levine, and Thomas K. Glasgow, both of Rocky River, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 403,378, Jul. 30, 1982, Pat. No. 4,446,199. This application Jan. 7, 1983, Ser. No. 456,460
Int. Cl.³ B05D 1/08
U.S. Cl. 427—34 19 Claims

1. A method of coating nickel-base and cobalt-base alloy substrate surfaces comprising the steps of

forming cermet powders by mechanically alloying elemental metallic powders selected from the group consisting of nickel-base, cobalt-base and iron base alloy constituents and refractory oxide powders,

arc-plasma spraying said cermet powders onto said surfaces to form a base coating having said refractory oxide dispersed therein, said dispersed oxide comprising between about 10 volume percent and about 75 volume percent of said base coating,

arc-plasma spraying powders of an alloy selected from the group consisting of nickel-base, cobalt-base, and iron base alloys onto said base coating to form an oxidation, hot corrosion, erosion resistant top coating, and

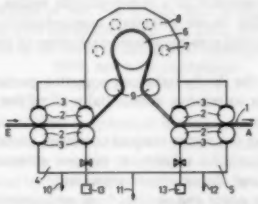
heat treating the coated substrate to improve the bonding of the base coating and the top coating to said substrate.

4,451,497

PROCESS FOR THE PRETREATMENT OF PHOTOGRAPHIC SUBSTRATES

Friedrich Dolezalek, Groebenzell; Günther Koepke, Odenthal, and Ulrich Rendelmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,137
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134615
Int. Cl.³ C03C 1/74; B05D 7/04, 3/06
U.S. Cl. 427—39 6 Claims



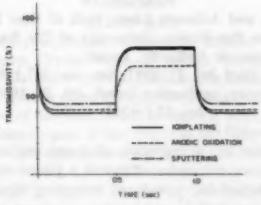
1. A process of preparing a substrate for a photographic emulsion to enhance adhesion of photographic emulsion to the substrate surface during subsequent coating with photographic emulsion wherein the substrate surface is treated to minimize electrostatic residual charge said process including the steps of passing the substrate web into a treatment chamber having a pressure reduced to from 100 to 1000 mbar below atmospheric pressure, wherein the web is first passed through means for maintaining the reduced pressure, exposing a surface of the substrate web in the treatment chamber to apparatus providing corona discharge to reduce electrostatic residual charge on the surface, and then passing the exposed substrate web through another means for maintaining the reduced pressure in the treatment chamber.

4,451,498

METHOD FOR MAKING OXIDE BASED ELECTROCHROMIC DISPLAY DEVICES

Eigo Hashimoto, Sakado, and Takanori Nanya, Sayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,823
Claims priority, application Japan, Nov. 5, 1980, 55-155585
Int. Cl.³ G02F 1/17
U.S. Cl. 427—38 3 Claims



1. A method of manufacturing an oxide based electrochromic display device comprising the steps of:

forming a pair of electrodes at least one of which is transparent on a pair of substrates at least one of which is transparent by physical vapor deposition in an arrangement in which said pair of electrodes are positioned opposite;

forming an anodic electrochromic material layer on one of said pair of electrodes by reactive ion plating in which one

material selected from the group consisting of iridium, rhodium and nickel is evaporated to produce an oxide and deposit it in an atmosphere including oxygen and water vapor; and

disposing an ion permeable insulating layer between said electrochromic material layer and the other electrode of said pair of electrodes.

3. A method of manufacturing an oxide based electrochromic display device comprising the ordered steps of:

forming a first electrode on a transparent substrate by physical vapor deposition;

forming one layer of an anodic electrochromic material layer and a cathodic electrochromic material layer on the top surface of said first electrode;

forming an ion permeable insulating layer on the top surface of said one layer by physcial vapor deposition;

forming another layer of anodic electrochromic material layer and cathodic material on the top surface of said ion permeable insulating layer; and

forming a second electrode on the top surface of another layer by physical vapor deposition;

said anodic electrochromic material layers being formed by evaporated reactive ion plating in an atmosphere including oxygen and water vapor.

4,451,499
METHOD FOR PRODUCING A BERYLLIUM OXIDE FILM

Kiyoshi Morimoto, Mobara; Toshinori Takagi, Nagaokakyo, and Hiroshi Watanabe, Mobara, all of Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

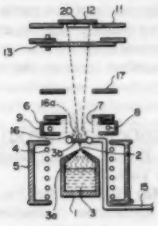
Continuation of Ser. No. 168,103, Jul. 14, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,151

Claims priority, application Japan, Jul. 24, 1979, 54-93166

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—38 **6 Claims**



1. A method for preparing a film of beryllium oxide comprising:

heating metallic beryllium in a closed crucible having at least one injection nozzle, thereby vaporizing said beryllium metal;

injecting said vapor through said nozzle into an evacuated chamber, whereby a stream of beryllium atoms is produced, while simultaneously injecting oxygen into said chamber around said stream to provide an atmosphere of oxygen having a pressure not greater than 10^{-2} of the vapor pressure in said crucible;

ionizing at least part of said vapor stream by irradiating said vapor stream with electron beams whereby a vapor stream containing ionized and unionized atoms is produced; and

permitting said vapor stream containing ionized and unionized atoms to impinge on a substrate surface together with said oxygen thereby forming a film of beryllium oxide on said substrate.

4,451,500
PROCESS FOR OBTAINING A HOMOGENEOUS PLANAR MAGNETIZATION LAYER IN A FERRIMAGNETIC GARNET

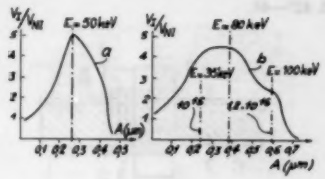
Philippe Gerard, Saint Ismier; Hubert Jouve, Biviers, and Michel Madore, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 13, 1982, Ser. No. 417,597

Claims priority, application France, Sep. 21, 1981, 81 17763

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **10 Claims**



1. A process making it possible to obtain at least one homogeneous planar magnetization layer in a ferrimagnetic garnet film obtained by liquid phase epitaxy in a solvent on a monocrystalline amagnetic substrate, wherein in said film at least one implantation of ions takes place, with the exception of the ions of gaseous elements and with the exception of the ions of the metallic elements involved in the composition of the solvent, this taking place at a dose making it possible to render the implanted part of the garnet film amorphous, and wherein the film and the substrate are annealed in order to crystallize in monocrystalline form that part of the film rendered amorphous by implantation.

4,451,501
METHOD OF MAKING A MAGNETIC RECORDING MEDIUM

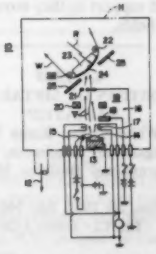
Makoto Nagao; Akira Nahara, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 15, 1982, Ser. No. 368,861

Claims priority, application Japan, Apr. 24, 1981, 56-62055

Int. Cl.³ B05D *3/06, 5/12*; H01F *10/02*

U.S. Cl. 427—40 **4 Claims**



1. A method of making a magnetic recording medium comprising, in a vacuum, moving a flexible substrate obliquely downwardly along a convex course in sliding contact with a curved surface of a fixed curved, finely oscillating guiding means in such a manner that said flexible substrate intersects a flow of vapor obtained by heating and evaporating a magnetic metal deposition material, passing a coolant inside said fixed curved guiding means to cool said flexible substrate, thereby

forming a thin film of said magnetic metal on the convex surface of said substrate.

4,451,502

METHOD FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

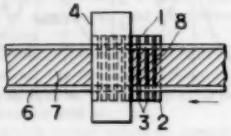
Kazuo Takada, 207 Toride, and Shinji Umeki, 1113-16 Iwamurata, both of Saku-shi, Nagano-ken, Japan

Continuation of Ser. No. 231,865, Feb. 5, 1981, abandoned. This application Aug. 20, 1982, Ser. No. 409,952

Claims priority, application Japan, Jan. 28, 1980, 55-7812

Int. Cl.³ B05D *3/14*

U.S. Cl. 427—48 **5 Claims**



1. A method for manufacturing a magnetic recording medium including the steps of applying a magnetic coating which contains magnetic particles to a support, subjecting said support having the magnetic coating thereon to magnetic orientation treatment while the magnetic coating is still in fluid condition and thereafter drying the magnetic coating, characterized in that said magnetic orientation is effected by passing said support having the undried magnetic coating thereon through a magnetic orientation field generated from magnetic field generating means which comprises permanent or DC magnets and an array of a plurality of parallel elongated members of a soft magnetic material all members of the plurality being spaced from and in a plane between said magnets, said elongated members being arranged in a plane close to said support, said elongated members extending traversely of the direction of movement of said support, there being a gap between all adjacent members, and said members being adapted to be magnetized by said magnets whereby said magnetic elongated members of soft magnetic material modify the magnetic field from said permanent or DC magnets to form a magnetic orientation field having periodic variations at intervals along said support so that said magnetic particles are subjected to alternate magnetic fields as they pass by each of the parallel elongated members so that said particles are alternately oriented vertically with respect to the movement of said support and in the direction of said support as they move through successive alternate magnetic fields.

4,451,503

PHOTO DEPOSITION OF METALS WITH FAR UV RADIATION

Samuel E. Blum, White Plains; Karen H. Brown, Yorktown Heights, and Rangaswamy Srinivasan, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,998

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—53.1 **16 Claims**

1. A method for photodeposition of a refractory metal onto a substrate, comprising the steps of:

producing a carbonyl compound vapor of said metal in the vicinity of said substrate,

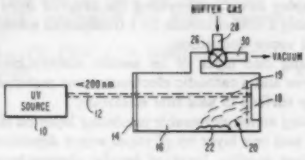
directing ultraviolet light of wavelengths less than 200 nm onto said vapor to photodecompose said vapor to release atoms of said metal in the vicinity of or on said substrate, and

condensing said metal atoms onto said substrate to form a continuous refractory metal layer thereon.

12. A method for forming a GaAs Mesfet, comprising the steps of:

introducing an impurity into a body of GaAs to form a doped layer therein,

photodepositing a layer of tungsten onto said doped layer to form a gate electrode by photodecomposing a carbonyl compound vapor of tungsten with ultraviolet light of



wavelengths less than 200 nm in the vicinity of or on said doped layer to free tungsten atoms which then condense onto said doped layer in a first region thereof defined by said ultraviolet radiation,

forming additional more highly doped regions in said doped layer surrounding said first region, and

forming source and drain contacts to said additionally doped regions.

4,451,504

PROCESS FOR APPLYING PHOSPHOR TO THE APERTURE MASK OF A CATHODE RAY TUBE

Anthony V. Gallaro, Auburn, and Gordon T. Foreman, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed May 20, 1983, Ser. No. 496,358

Int. Cl.³ B05D *3/02, 1/32, 1/02*

U.S. Cl. 427—64 **11 Claims**

1. A process for applying phosphor to the aperture mask of cathode ray tube, the process comprising the steps of:

(a) coating at least a portion of the mask with a composition comprising a dispersion of fine particle size phosphor in a binder-containing coating vehicle; and

(b) baking the aperture mask to remove the vehicle and leave an adherent phosphor layer on the mask.

4,451,505

METHOD OF PRODUCING PRINTED CIRCUIT BOARDS

Johannes M. Jans, Evreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1982, Ser. No. 380,165

Claims priority, application Netherlands, May 29, 1981, 8102620

Int. Cl.³ B05D *3/06, 3/10, 1/06*

U.S. Cl. 427—98 **3 Claims**

1. In a method of producing a printed circuit board on an insulating or non-insulating substrate supplied with a thermosetting adhesive layer, comprising roughening the surface of said adhesive layer, contacting said roughened surface with a liquid capable of providing said roughened surface with metal nuclei capable of being intensified to form a metal layer by an electroless metal plating solution, exposing said metal nuclei to an electroless metal plating solution thereby forming a metal layer on said roughened surface and then heating the resultant assembly, the improvement comprising roughening the surface of said adhesive layer by spraying the surface of said adhesive layer with a suspension of hard particles having a particle size of between 50 and 200 μm, spraying the thus roughened surface with a suspension of particles of a light sensitive semiconductor metal oxide, which metal oxide, after exposure to light, is capable of releasing copper and/or a metal nobler than copper from a solution of the relevant metal salt, the spraying with the suspension of said metal oxide particles being carried

out in such a manner that said metal oxide particles reach said roughened surface in a substantially dry state without drops of the suspension liquid being deposited on said surface, thus providing said roughened surface with a uniformly distributed layer of said metal oxide particles, exposing said layer to light and, either before or after said layer is exposed to light, spraying said layer with a solution of a salt of copper or a metal nobler than copper in a manner such that the particles of said salt reach said layer in a substantially dry state without drops of the liquid of said solution being deposited on said layer, thereby forming metal nuclei in exposed areas of said layer.

4,451,506

SIDE SEAM-COATED WELDED CANS AND PROCESS FOR PREPARATION THEREOF

Seishichi Kobayashi, Yokohama; Tatsuo Mori, Kawasaki; Tetsuo Miyazawa, Yokohama; Kazuo Taira, Tokyo; Makoto Horiguchi, Fujisawa, and Susumu Takahashi, Yamato, all of Japan, assignors to Toyo Seikan Kaisha Ltd, Tokyo, Japan

Division of Ser. No. 164,148, Jun. 30, 1980, Pat. No. 4,382,525. This application Sep. 24, 1982, Ser. No. 422,589

Claims priority, application Japan, Jun. 30, 1979, 54-82017; Feb. 13, 1980, 55-15515

Int. Cl.³ B05D *1/02*; B65D *7/38*

U.S. Cl. 427—239 **6 Claims**

1. A process for the preparation of side seam-coated welded cans, which comprises applying a resin paint to a welded can body having a seam formed on the side face thereof at least on one surface of said seam and baking the coated paint to form a coating covering said side seam, wherein said resin paint comprises a dispersion medium composed of a solution of a thermosetting resin and a dispersed phase of resin particles having a number average particle size of 0.1 to 80 μm and being composed of a thermoplastic resin having a softening point of 50° to 300° C. as determined according to the ring and ball method, the volume ratio of the thermosetting resin to the thermoplastic resin in the coating ranges (A) from 95/5 to 25/75 wherein the thermosetting resin forms the continuous phase and the thermoplastic resin forms the dispersed phase or (B) from 20/80 to 1/99 wherein the thermoplastic resin forms the continuous phase and the thermosetting resin forms the dispersed phase, and the paint coated on the side seam is baked under such conditions that evaporation of a solvent in the solution of the dispersion medium is first caused and softening of the thermoplastic resin is then caused, the thermoplastic polymer containing in the main chain or side chain a carboxyl group derived from a carboxylic acid, a carboxylic acid salt, a carboxylic acid anhydride, a carboxylic acid ester, a carboxylic acid amide, a carbonic acid ester, urea, or urethane, the carboxyl groups having a concentration of 12 to 1400 meq per 100 g of the polymer.

4,451,507

AUTOMATIC LIQUID DISPENSING APPARATUS FOR SPINNING SURFACE OF UNIFORM THICKNESS

John P. Beltz, Willingboro, and Kenneth W. Hang, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,835

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—240 **13 Claims**

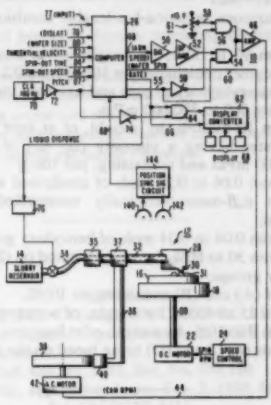
1. In a system for automatically coating material on a rotating surface having means for dispensing viscous liquid containing the coating material on said surface through a dispenser nozzle supported by an arm, and means for moving said arm and said nozzle radially over said surface whereby the liquid is dispensed over said surface along a spiral path, characterized by

means for varying the angular rotation velocity (ω) of said surface as a function of the radial position (R) of said dispensing nozzle such that the tangential velocity (V_t) determined by $R \times \omega$ is substantially constant over said surface,

means for varying the rate of radial movement of said nozzle to maintain a substantially constant pitch of the spiral path; and

means for controlling the flow of said liquid through said nozzle at a substantially constant flow rate proportional to said tangential velocity whereby the liquid is dispensed so that the volume per square of material over said surface is constant.

8. A method for automatically coating a material on a rotating surface including the step of dispensing a viscous liquid containing the coating material through a nozzle moved radially over the surface whereby the liquid is dispensed over the surface along a spiral path, characterized by the steps of:



varying the angular rotation velocity (ω) of said surface as a function of the radial position (R) of said dispensing nozzle such that the tangential velocity (V_t) = $R \times (\omega)$ is substantially constant over said surface,

varying the rate of radial movement of said nozzle to maintain a substantially constant pitch of the spiral path; and

controlling the flow of liquid through said nozzle to a substantially constant value,

whereby the liquid is dispensed so that the volume per square of material over said surface is constant.

4,451,508

HARD FACING OF METAL SUBSTRATES USING MATERIAL CONTAINING VC AND IMPROVED FLUX COMPOSITIONS THEREFOR

Harry J. Brown, Utica, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1982, Ser. No. 393,226

Int. Cl.³ B23K *9/00*

U.S. Cl. 427—423 **14 Claims**

1. In a method for hard facing a surface of an iron or iron base alloy substrate by providing molten iron or iron base alloy on a portion of said surface and applying to the molten metal a hard facing material containing vanadium carbide and a flux therefor, the improvement which comprises employing as the flux a composition containing nickel boron or calcium silicon.

4,451,509

RADIATION-HARDENABLE AQUEOUS BINDER EMULSIONS OF ACRYLATE PREPOLYMER WITH UNSATURATED POLYESTER EMULSIFIER HAVING BENZYLOXY AND ALKYLENE-OXY GROUPS

Walter Frank, Rain/Lech; Otto Bendszus, Krefeld; Jürgen Meixner, Krefeld; Hans J. Freier, Krefeld, and Hans-Joachim Traenckner, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 3, 1983, Ser. No. 455,222

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200907

Int. Cl.³ C08F 2/50; B05D 3/06; B32B 27/40

U.S. Cl. 427—54.1 4 Claims

1. An aqueous radiation-hardenable emulsion which comprises:

(A) from 90 to 50%, by weight, of at least one acrylate prepolymer containing, per 100 g, from 0.2 to 0.65 mols of (meth)acryloyloxy groups and having a viscosity (20° C.) of from 500 to 300,000 mPas;

(B) from 10 to 50%, by weight, of at least one emulsifier polyester having a viscosity (20° C.) of from 2000 to 200,000 mPas and containing, per 100 g:

(1) from 0.06 to 0.28 mols of condensed units of at least one α,β-mono-olefinically unsaturated dicarboxylic acid;

(2) from 0.04 to 0.34 mols of benzyloxy groups; and

(3) from 30 to 80%, by weight, based on (B), of alkyleneoxy groups;

the sum of (A) and (B) amounting to 100%;

(C) from 25 to 400%, by weight, of water; and

(D) from 0 to 10%, by weight, of at least one photoinitiator; the contents of (C) and (D) being based on the sum of (A) and (B).

4,451,510

AUTOMATIC ARTIFICIAL TREE

Pierre U. Boisvert, Granby, and Jean-Daniel Bapst, Ste-Cécile de Milton, both of Canada, assignors to Barcana Ltee, Quebec, Canada

Filed Feb. 26, 1982, Ser. No. 352,590

Claims priority, application Canada, Jan. 18, 1982, 394375

Int. Cl.³ A47G 33/06

U.S. Cl. 428—8 10 Claims

1. An automatic artificial tree comprising at least one main section, said main section comprising vertically extending support means, a plurality of branch holders of hollow construction mounted to said support means, coaxially thereof, a plurality of branches pivoted to said branch holders for projecting radially and generally perpendicularly of said support means when said main section is in its normal upright position but free to fold to a collapsed position generally parallel to said support means when said main section is upside-down, each branch holder comprising a branch holding ring and a tubular spacer, depending from said ring in fixed relationship thereto, each branch holding ring comprising a generally planar disc-shaped body of rigid material, with a central hole for including said support means, a coaxial fulcrum ring on the upper surface of said disc-shaped body, a plurality of radially extending branch receiving slots on said upper surface below said fulcrum ring, said slots having laterally confining means, each branch having the tip of its inner end bent upwardly behind said fulcrum ring at such an angle that upon movement of the tree to an upright position, the bent inner end is free to swing down about the fulcrum ring until the branch rests in its respective slot.

4,451,511

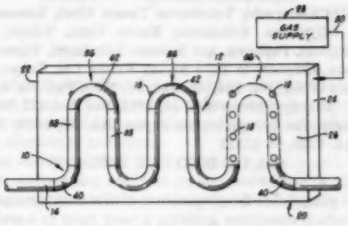
SYSTEM FOR PROTECTING GLASS STRUCTURES IN A COMBUSTION ZONE

John C. Magyar, Hamilton, Miss., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jul. 30, 1982, Ser. No. 403,560

Int. Cl.³ B05D 1/00; B32B 1/08

U.S. Cl. 428—35 17 Claims



1. A process for substantially protecting from devitrification a glass structure having an outside surface disposed within a combustion zone comprising the steps of:

providing a source of heat refractory material substantially opaque and non-reflective to visible light and substantially resistant to chipping, blistering, cracking and peeling at temperatures of up to about 2500 degrees farenheit; and

applying the heat refractory material to the outside surface of the glass structure to be protected substantially to reduce devitrification of the glass structure at relatively high temperatures.

4,451,512

MULTI-LAYER PLASTIC VESSEL

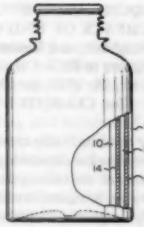
Jinichi Yazaki, Tokyo; Kozaburo Sakano, Kawasaki, and Junichi Matsuo, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,461

Claims priority, application Japan, Feb. 8, 1983, 58-18036

Int. Cl.³ B65D 23/00

U.S. Cl. 428—36 16 Claims



1. A multi-layer plastic vessel comprising a laminate including at least one layer composed mainly of a moisture-resistant thermoplastic resin, at least one layer composed mainly of an ethylene-vinyl alcohol copolymer and a thermoplastic resin adhesive layer interposed between both the resin layers, wherein said adhesive layer is composed of a composition

comprising an acid- or acid anhydride-modified olefin resin and an epoxidized unsaturated carboxylic acid ester.

4,451,513
Patent Not Issued For This Number

4,451,514
AUTOMOTIVE HEAT REFLECTOR SHIELD
Brion L. Hunt, One Drayton St., Savannah, Ga. 31401
Filed Dec. 24, 1981, Ser. No. 334,223
Int. Cl.³ B60J 7/08
U.S. Cl. 428—71 **5 Claims**

1. An automotive heat reflector shield for excluding sun rays, having a minimum angle of incidence of 45°, from penetrating an automobile roof equipped with a transparent roof construction and having an interior rim therein, comprising in combination,

a shell member made of a rigid, high impact strength plastic,

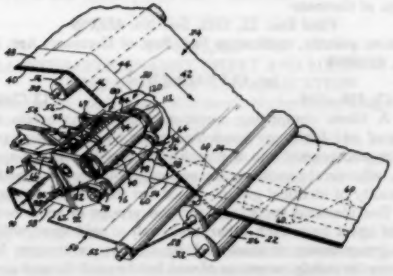
a shallow flat depression on said shell member,

means constituting a thermally and acoustically insulating layer carried within the boundaries of said shallow flat depression of said shell member,

a thermal and light reflecting surface layer on the outer surface of said thermal and acoustic insulating layer, and

attachment means for temporarily supporting said shell member on said interior rim and the interior surface of said automobile roof to cover said transparent roof construction, said attachment means including a peripheral extension of said shell member and intergal therewith.

4,451,515
NETWORK REINFORCING FORMING APPARATUS AND METHOD
Victor H. Clausen, and Charles E. Asbury, both of Vancouver, Wash., assignors to H. B. Fuller Company, St. Paul, Minn.
Filed Nov. 19, 1981, Ser. No. 322,893
Int. Cl.³ B32B 3/28, 3/02
U.S. Cl. 428—112 **9 Claims**



1. A corrugated board product comprising:

(a) a first liner sheet;

(b) a second liner sheet;

(c) corrugated flutes adhered to said first liner sheet;

(d) means for adhering said second liner sheet to said corrugated flutes, said corrugated flutes positioned between said first and second liner sheets;

(e) wherein said product thereby formed is scored to bifurcate said product into two portions, one on either side of said scoring, defining planes, the angle between which can be varied by pivoting one of said portions relative to the other of said portions about said scoring; and

(f) a reinforcing filament network sandwiched between said corrugated flutes and said second liner sheet, said network including:

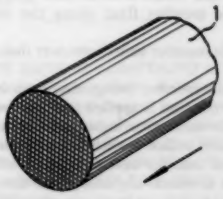
(i) a pair of generally linearly extending filaments straddling said scoring; and

(ii) a serpentine filament extending in a direction in which said generally linearly extending filaments run and sinuating across said pair of generally linearly extending filaments, said serpentine filament being bonded to said pair of linearly extending filaments.

4,451,516
LOW THERMAL EXPANSION CERAMIC ARTICLE
Kiminari Kato, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan
Filed Aug. 31, 1981, Ser. No. 298,110
Claims priority, application Japan, Sep. 3, 1980, 55-121202
Int. Cl.³ B32B 3/12
U.S. Cl. 428—116 **1 Claim**

1. A low thermal expansion ceramic article having a thermal expansion coefficient of not higher than 2.5×10^{-6}/°C. within the temperature range of 40°–800° C., comprising cell structured ceramic parts consisting of thin walls bonded to bulk-structured parts having a large thickness through glass-ceramics consisting essentially of 10–20% by weight of MgO, 22.3–40% by weight of $A_{12}O_3$, 40–60% by weight of SiO_2, 0.1–3% by weight of BaO, 0.01–1% by weight of ZrO_2 and not more than 10% by weight of impurities.

4,451,517
CERAMIC HONEYCOMB CATALYST SUPPORT COATED WITH ACTIVATED ALUMINA
Kazuhiro Inoguchi; Kunio Okamoto, both of Okazaki, and Keiichiro Isomura, Takahama, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Jul. 15, 1982, Ser. No. 398,713
Claims priority, application Japan, Jul. 18, 1981, 56-112657
Int. Cl.³ B32B 3/12
U.S. Cl. 428—116 **5 Claims**



1. A ceramic honeycomb catalyst support having a honey-

comb structure with an activated alumina coating thereon, adapted for purifying exhaust gases and exhibiting improved resistance to thermal shock, said honeycomb structure formed of a ceramic material having a coefficient of thermal expansion below that of activated alumina, said honeycomb structure having a matrix of thin walls forming a multiplicity of open ended cells or passages defined by the thin walls extending from one end of the honeycomb to the other end,

said honeycomb structure having in the surface walls thereof a multiplicity of minute pores and a multiplicity of fine cracks of a width smaller than said minute pores, said fine cracks and minute pores formed during the fabrication of the honeycomb structure, and a layer of activated alumina adhered onto the surfaces of said thin walls, said fine cracks being substantially completely devoid of said activated alumina such that the area within said fine cracks is unfilled and are free to act as buffer zones to absorb deformation of the honeycomb structure as it expands when heated.

4,451,518

REINFORCING MEMBER

Toshikatu Miura; Hiroto Kikuchi; Yukio Okada, and Tsutomu Yoshioka, all of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

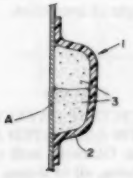
Filed Mar. 9, 1982, Ser. No. 356,452

Claims priority, application Japan, Mar. 16, 1981, 56-37576

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ B32B *5/20, 3/10*

U.S. Cl. 428—137 **7 Claims**



1. A reinforcing member including:

a reinforcing resin layer, which is elastic in its semi-hardened or unhardened state before being applied to an object to be reinforced, and which is hardenable to a rigid state;

an expandable member fixed along the reinforcing resin layer;

the expandable member being narrower than the reinforcing resin layer;

the expandable member being elastic at least before the reinforcing member is applied to the object;

the expandable member being expandable to form a bead-like projection before the reinforcing resin layer hardens;

the expandable member consisting of at least two divided pieces so as to selectively enlarge the dimensions thereof;

the reinforcing resin layer having its edge portions extending beyond the expandable member, the underside of the edge portions thereof being adapted to adhere to the object;

the reinforcing resin layer including fibers for reinforcing the resin layer.

4,451,519

DRAWING MATERIAL BACKING FOR MAKING TECHNICAL AND DIAGRAMMATIC DRAWINGS

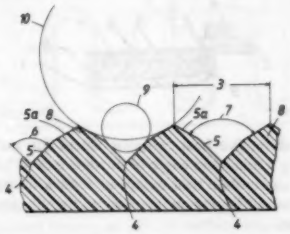
Hans Irrgeher, Dauphinestrasse 144, A-4020 Linz, Austria

Filed Dec. 23, 1982, Ser. No. 452,796

Claims priority, application European Pat. Off., Dec. 29, 1981, 81890212.4

Int. Cl.³ B32B *3/30, 3/28*

U.S. Cl. 428—167 **3 Claims**



1. A drawing material backing for making technical and diagrammatic drawings, comprising a flexible plastic sheeting provided on one side with an impressed orthogonal grid consisting of intersecting fine V-shaped guiding grooves uniformly spaced apart 0.5 or 1 millimeter and defining pyramid-shaped embossed elevations, the grooves having a bottom and side faces including a steep angle next to the bottom of the groove and a flatter angle in their upper portion so that the embossed elevations have the shape of pyramids having angled sides.

4,451,520

SPOT BONDED PATTERN FOR NON-WOVEN FABRICS

Bohuslav Teci; Erich Fahrbach; Jürgen Knoke, and Hans C. Assent, all of Weinheim, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,069

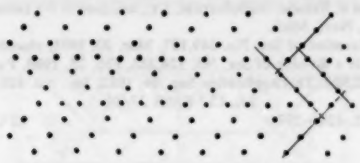
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216099

Int. Cl.³ B32B *27/14*

U.S. Cl. 428—198 **13 Claims**

1. A fabric comprising a non-woven fabric wherein the fibers of said fabric are bonded together by a bonding agent and/or autogenously in a plurality of equally spaced-apart spots, wherein the spots are the same size and are combined in a plurality of identical groups of not less than three nor more than five identical spots, each of said groups of spots being spaced apart from each other, and each of said spots within each group being positioned along a curve or straight line wherein the steady extension of said line beyond the end-spots of said group positioned along said line intersects an adjacent line along which an adjacent group of spots is positioned at a

point outside the midpoint of the adjacent line, and wherein the ratio of the distance separating the spots within each group of



spots to the distance from an end-spot in each group to the next adjacent line along which an adjacent group of spots is positioned, is about 0.5 to about 3.0.

4,451,521

SECURITY PAPER WITH AUTHENTICITY FEATURES IN THE FORM OF SUBSTANCES LUMINESCING ONLY IN THE INVISIBLE REGION OF THE OPTICAL SPECTRUM AND PROCESS FOR TESTING THE SAME

Wittich Kaule, Gauting, and Gerhard Stenzel, Munich, both of Fed. Rep. of Germany, assignors to Gao Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

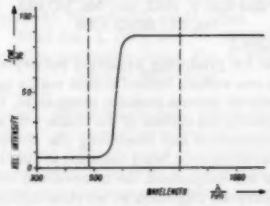
PCT No. PCT/DE81/00081, 371 Date Oct. 23, 1981, 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/03510, PCT Pub. Date Dec. 10, 1981

PCT Filed May 29, 1981, Ser. No. 314,842

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020599

Int. Cl.³ B32B *23/00, 3/00;* G01J *1/00;* D21H *5/10*

U.S. Cl. 428—199 **28 Claims**



1. Security document with authenticity characteristics comprising: a substrate and a luminescing substance, wherein the luminescing substance is constructed to exhibit, when excited, luminescence emission only in the invisible region of the optical spectrum, said luminescing substance comprising a luminophore combined with an absorbing material having an absorption spectrum which includes a portion of the visible spectrum in which said luminophore emits radiation.

4,451,522

TRANSFERABLE ENAMEL SHEET AND METHOD AND APPARATUS FOR ITS FABRICATION

Hubertus M. de Vroom, Warmond, Netherlands, assignor to Nordipa AG, Schwerzenbach, Switzerland

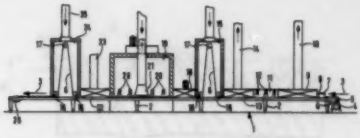
Continuation-in-part of Ser. No. 205,301, Nov. 10, 1980, abandoned. This application Oct. 27, 1981, Ser. No. 315,295

Claims priority, application Netherlands, Oct. 29, 1980, 8005935

Int. Cl.³ B32B *3/18;* B41M *3/14*

U.S. Cl. 428—201 **22 Claims**

1. In a transferable enamel sheet formed as a laminate including a carrier film, a silicone release layer applied thereon, an enamel layer and a pressure sensitive adhesive layer, the improvement of a neutralization layer of wax-like consistency applied to the release layer, said neutralization layer being comprised of a mixture of branched and unbranched hydrocar-



bon chains with an average length of 30 carbon atoms and a COOH group at several locations in the chain.

4,451,523

CONFORMAL COATING SYSTEMS

Larry A. Nativi, Rocky Hill, and Kris Kadziela, East Hartford, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 441,165, Nov. 11, 1982, abandoned. This application Aug. 31, 1983, Ser. No. 528,286

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—209 **16 Claims**

1. An essentially solvent-free one-part coating composition, especially useful for conformal coating, comprising:

(1) at least one urethane-acrylate or urethane-methacrylate compound;

(2) an acrylate or methacrylate compound containing an allylic group;

(3) a non-allylic acrylate or methacrylate diluent;

(4) a polymerization initiator of the photoinitiator type; and

(5) a metal drier.

4,451,524

POLYPROPYLENE STRAP AND METHOD OF MANUFACTURING THE SAME

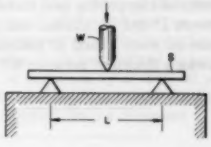
Hiroyuki Matsumoto, Tokyo, Japan, assignor to Tsukasa Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,382

Claims priority, application Japan, Jan. 14, 1983, 58-3305

Int. Cl.³ B32B *7/02, 9/00;* D01D *5/12*

U.S. Cl. 428—213 **2 Claims**



1. A polypropylene strap formed from a single polypropylene sheet in which both surface layers are stretched at a low draw ratio of 1.2–3 and an inner portion is stretched at a high draw ratio of 10–18.

4,451,525

PRODUCTS HAVING COMPOUND MEMBRANE

Shiyouzou Kawazoe; Zenichi Ueda; Toshihiko Sugimoto, and Takahiko Moriuchi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 18, 1981, Ser. No. 244,929

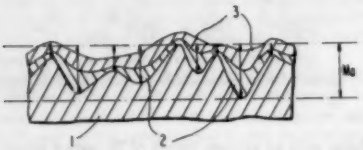
Claims priority, application Japan, Mar. 19, 1980, 55-35475

Int. Cl.³ B32B *7/02, 15/08*

U.S. Cl. 428—213 **10 Claims**

1. A product with a compound membrane which comprises a transparent molded substrate having a maximum surface

roughness of about 50 to 20,000 Å, a metal membrane having an average thickness of about 50 to 300 Å which is equal to or less than the maximum surface roughness of the molded sub-



strate on said molded substrate and a dielectric membrane having a thickness of 100 to 60,00 Å and having a refractive index of about 1.3 or more for visible light and a visible light transmittance of about 50% or more on said metal membrane.

4,451,526

MULTILAYER COMPOSITE MATERIAL, ESPECIALLY FOR CLOSURES FOR PLASTIC CONTAINERS

Bruno Claude, Montivilliers; Jean-Jacques Labaig, Le Havre, and Christian Martinez, Harfleur, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Aug. 20, 1982, Ser. No. 410,035

Claims priority, application France, Aug. 26, 1981, 81 16315

Int. Cl.³ B32B *7/02, 27/08*

U.S. Cl. 428—216 **8 Claims**

1. A multilayer composite material intended in particular for the manufacture of covers or caps for the closure of a container, said composite material comprising

(a) a metal foil,

(b) a polyolefin film, and

(c) an adhesive layer bonding the metal foil and the polyolefin film together and formed of two compounds A and B, compound A being a copolymer of an aliphatic monoolefin and an unsaturated monoethylenic carboxylic acid having good adhesion for the metal foil and the polyolefin film, and compound B being a compound effective to reduce the adhesion of compound A for the metal foil and/or the polyolefin film, the improvement in said composite material comprising said metal foil having a thickness between 25 and 75 microns; said polyofin film having a thickness between 10 and 30 microns; and said adhesive layer having a thickness between 0.5 and 6 microns.

4,451,527

CONFORMABLE METAL-CLAD LAMINATE

Murray Olyphant, Jr., Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 28, 1981, Ser. No. 287,773

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—220 **7 Claims**

1. In a metal clad laminate of at least about 20 mils dielectric thickness having a metallic foil on at least one surface thereof and containing at least one low-loss dielectric soft polymeric material having a room temperature elongation of at least about 75 percent and a tensile modulus of less than about 120,000 psi and wherein the polymer must have a dielectric loss tangent of less than 0.001 in the frequency range of from about 1 to about 10^{G}Hz and at least two layers of glass cloth reinforcement, the improvement comprising the separation of said metallic foil from the nearest of said layers of glass cloth reinforcement with at least about 7 mils of said soft polymeric material.

4,451,528

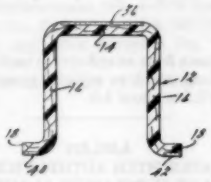
COMPOSITE FIBER REINFORCED MEMBER AND METHOD

Charles J. Krause, Nicholesville, Ky., assignor to NI Industries, Inc., Novi, Mich.

Continuation of Ser. No. 249,107, Mar. 30, 1981, abandoned, which is a division of Ser. No. 124,353, Feb. 25, 1980, Pat. No. 4,305,903. This application Sep. 16, 1982, Ser. No. 418,807

Int. Cl.³ B32B *27/36*

U.S. Cl. 428—287 **12 Claims**



1. A composite fiber reinforced article comprising a body comprised of a cured thermosetting resin incorporating glass fibers therein, said body having integrally bonded over at least one localized area thereof, a surface stratum comprised of a cured compatible thermosetting resin having high-strength graphite fibers therein.

4,451,529

COATED POLYSTYRENE FOAMS AND COMPOSITIONS AND PROCESSES FOR THE PRODUCTION THEREOF

Stuart R. Kerr, III, Pomona, and Milton Meshirer, Riverdale, both of N.Y., assignors to Beacon Chemical Company, Inc., Mount Vernon, N.Y.

Filed Apr. 9, 1982, Ser. No. 367,043

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—319.3 **12 Claims**

1. A process for producing expanded polystyrene articles having at least one surface thereof coated with a tough, durable, impact resistant solvent-resistant integument, the process comprising covering the surface of the article with a UV-curable coating composition and irradiating the covered surface with ultra-voilet or electron beam radiation to cure the composition and form the integument, the composition comprising a UV-curable diacrylate oligomer, an acrylate-terminated reactive diluent, and a photoinitiator, the inert diluent being present in an amount to provide a viscosity of from 800 to 20,000 centipoise, at room temperature, to the coating composition and the oligomer and diluent being inert to the polystyrene.

4,451,530

SECURITY PAPER WITH AUTHENTICITY FEATURES IN THE FORM OF LUMINESCING SUBSTANCES

Wittich Kaule, Gauting; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH., Munich, Fed. Rep. of Germany

PCT No. PCT/DE81/00079, 371 Date Oct. 23, 1981, 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/03508, PCT Pub. Date Dec. 10, 1981

PCT Filed May 29, 1981, Ser. No. 314,843

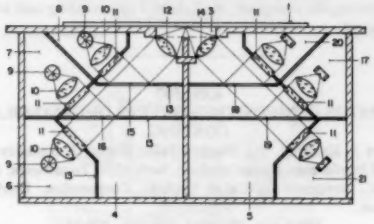
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020652

Int. Cl.³ B32B *5/16*; G01J *1/42*

U.S. Cl. 428—323 **22 Claims**

1. Security document with authenticity features comprising: a substrate material supporting a luminescing substance, having a known emission spectrum and a known excitation spectrum, said luminescing substance comprising a luminophore and an absorbing substance, said absorbing substance having an

absorption spectrum which partly overlaps at least one of said known emission spectrum and said known excitation spectrum of the luminophore whereby said luminescing substance has an



emission spectrum which is characteristically altered from said known emission spectrum whereby said characteristically altered portion of the spectrum is used for authentication of the security document.

4,451,531

MAGNETIC RECORDING MEDIUM AND METHOD

Yukihiro Isobe, 3204, Irisawa, Usada-machi, Minamisaku-gun, Nagano-ken; Kazushi Tanaka, 438-1, Otsu, Komoro-shi, Nagano-ken; Masaharu Nishimatsu, 2494-16, Mikageshinden, Komoro-shi, Nagano-ken; Osamu Shinoura, 3272, Nakagomi, Saku-shi, Nagano-ken, and Yuichi Kubota, 197-46, Mukaida, Hei, Komoro-shi, Nagano-ken, all of Japan

Filed Jun. 1, 1982, Ser. No. 384,063

Claims priority, application Japan, Jun. 5, 1981, 56-85689

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—329 **15 Claims**

1. A magnetic recording medium which comprises a film base, a magnetic coating layer provided on a surface of the film base and a backing layer provided on the other surface of the film base having a tensile modulus at 100% elongation from 25 to 300 kg/cm^2 and containing an abrasive powder having a hardness of at least 4 in the Mohs scale dispersed in a matrix of a radiation-sensitive polymeric binder cured by the irradiation with a high energy radiation, the amount of abrasive powder being from 5 to 350 parts by weight per 100 parts of polymeric binder.

4,451,532

MAGNETIC RECORDING COMPOSITION EMPLOYING MONO-DISPERSED SPHERICAL LOAD-BEARING PARTICLES

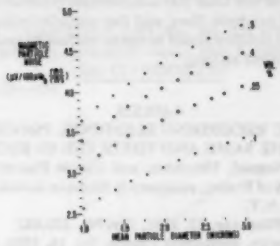
Vincent M. DePalma; Reginald J. Dilley; Mary F. Doerner, all of San Jose, and Daniel A. Nepela, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1981, Ser. No. 268,415

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—336 **4 Claims**

1. A magnetic recording medium comprising magnetic particles and non-magnetic load-bearing particles disposed in a binder as a coating on a substrate, substantially all of said load-bearing particles being a monodispersion of spherical particles, the diameter of substantially all of said spherical



load-bearing particles exceeding said coating thickness by not more than 20 percent.

4,451,533

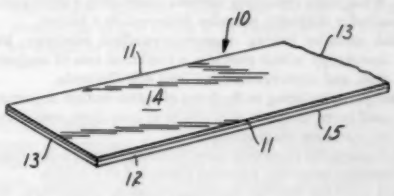
DISPENSABLE POLYPROPYLENE ADHESIVE-COATED TAPE

Roy Wong, White Bear Lake; James J. Pedginski, Stillwater, and Andrew H. Wong, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 9, 1983, Ser. No. 465,162

Int. Cl.³ B32B *27/06*; C09J *7/02*

U.S. Cl. 428—337 **13 Claims**



1. In a tape comprising a biaxially oriented elongate polypropylene film backing having a thickness of less than about 0.005 centimeters and a layer of adhesive coated on one surface of the backing, the improvement wherein the backing will break before it can be stretched in its longitudinal direction by about 30 percent, and can be stretched by at least 40 percent in its transverse direction before breaking to provide a tape that can be easily manually dispensed from a dispenser.

4,451,534

SYNTHETIC FIBERS IMPARTED WITH AN IRREGULAR SURFACE AND A PROCESS FOR THEIR PRODUCTION

Takao Akagi; Shinji Yamaguchi; Katsura Maeda, all of Kurashiki, and Kazuo Yamamoto, Nishinomiya, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Nov. 3, 1982, Ser. No. 438,981

Claims priority, application Japan, Nov. 9, 1981, 56-180464

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—372 **6 Claims**

1. A surface-modified synthetic fiber formed by plasma irradiating a synthetic fiber containing fine particles in which recesses and projections are formed on the surface of the synthetic fiber, said recesses being formed by being etched with plasma in the portion not shielded by the fine particles, said projections being formed by not being etched in the portion shielded by the fine particles, the synthetic fiber being imparted with a nondirectional irregular surface such that the distance between the center points of adjacent projections is between approximately 0.03 and 1 microns and the number of

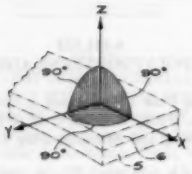
projections is between approximately 1 and 200 per square micron, said synthetic fiber containing 0.1-10% by weight of said fine particles, said fine particles having an average single particle size of less than 200 millimicrons prior to incorporation into said synthetic fiber, said fine particles being effective to impart said nondirectional irregular surface to said synthetic fiber upon plasma etching.

4,451,535

MAGNETIC RECORDING ELEMENTS, PROCESS FOR MAKING THE SAME AND THEIR USE IN RECORDING

Bernard J. Pingaud, Vincennes, and Claude Poncet, Noisy-le-Grand, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,483
Claims priority, application France, Jul. 16, 1980, 80 401064
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—329 **14 Claims**



1. A magnetic recording element comprising a layer containing acicular magnetic particles dispersed in a binder,

said particles having magnetocrystalline anistropy, shape anisotropy which provides a preferred axis of magnetization, and coercivities of at least 450 Oersteds,

said particles being in the form of a distribution imparting to said layer magnetic isotropy as to coercivity and intensity of remanent magnetization.

7. A magnetic recording element comprising a layer containing acicular magnetic particles dispersed in a binder,

said particles having magnetocrystalline anisotropy, shape anisotropy which provides a preferred axis of magnetization, and coercivities of at least 450 Oersteds,

said particles being in the form of a distribution having spherically symmetrical intrinsic magnetic properties, whereby said layer (a) has coercivities that are substantially the same in three orthogonal directions and (b) is capable of supporting intensities of remanent magnetization that are also substantially the same in three orthogonal directions.

4,451,536

HEAT DISTORTION-RESISTANT THERMOPLASTIC SEMI-CONDUCTIVE COMPOSITION

Anthony Barlow, and Lawrence A. Meeks, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,560
Int. Cl.³ C08K *3/04*; H01B *17/64*
U.S. Cl. 428—383 **21 Claims**

1. A heat distortion-resistant non-crosslinked thermoplastic semiconductive composition comprising a copolymer selected from the group consisting of ethylene-vinyl acetate copolymer and ethylene-acrylate ester copolymer, an admixture of high density polyethylene and linear low density polyethylene and carbon black, said ethylene copolymer being present in an amount of from about 20 to about 60 weight percent, said admixture of polyethylene homopolymers being present in an amount of from about 10 to about 45 weight percent with the low density polymer constituting about 40 to about 75 percent of said admixture, all other percentages being based on the weight of the total composition and the carbon black concentration being present in a conductive amount.

18. An insulated electrical conductor comprising an electrically conductive core, a layer of insulative material immediately surrounding said core, and a semi-conductive shield comprising the composition of claim 1 surrounding said insulative layer.

4,451,537

ASBESTOS COMPOSITION HAVING ORGANO-SILANE COATING

Robert J. Kennedy, Sr., Niagara Falls; Robert J. Kennedy, Jr., and Sundaresan Ramachandran, both of N. Tonawanda, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1981, Ser. No. 279,157
Int. Cl.³ B32B *5/16*; B05D *1/18*; C07F *7/10*
U.S. Cl. 428—391 **6 Claims**

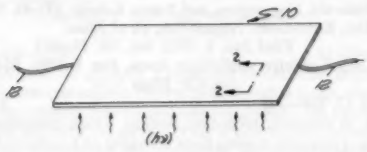
1. An asbestos base material comprising opened chrysotile asbestos having an outer octahedral magnesia layer and an organo-silane coating bonded thereto and overlying the asbestos base material.

4,451,538

HIGH HYDROGEN AMORPHOUS SILICON

David P. Tanner, Thousand Oaks, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 13, 1983, Ser. No. 494,199
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—447 **14 Claims**



1. A process of forming amorphous silicon from a glow discharge comprising the steps of:

providing a gas atmosphere containing H_2 and SiH_4 in a ratio of at least approximately 9 to 1, at a flow rate of no more than 10^{-3} SCCM per cubic centimeter;

establishing a glow discharge by discharging electrical power through the atmosphere at a density of no more than 0.08 watts per square centimeter; and

exposing a substrate to the glow discharge to deposit amorphous Si:H thereon.

4,451,539

SURFACING FOILS FOR COATING PLASTICS PARTS

Antoine Vallee, and Michel Goguelin, both of Charavines, France, assignors to Arjomari-Prioux, France

Filed Jun. 28, 1982, Ser. No. 392,678
Claims priority, application France, Jul. 2, 1981, 81 13029
Int. Cl.³ B32B *27/08*
U.S. Cl. 428—515 **4 Claims**

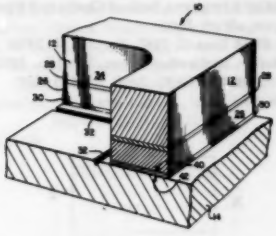
1. A surfacing foil composition for coating a plastic article which foil comprises from 30% to 90% by weight of at least one polyolefin dough; from 2% to 15% by weight of a binder; 0.5% to 5% by weight by at least one flocculant and the remainder comprising at least one powder element selected from the group consisting of thermoplastics, thermoplastic elastomers, fillers, carbon and pigments.

4,451,540

SYSTEM FOR PACKAGING OF ELECTRONIC CIRCUITS

Phillips C. Baird, Lakeville, and Raymond J. Duff, South Dartmouth, both of Mass., assignors to Isotronics, Inc., New Bedford, Mass.

Filed Aug. 30, 1982, Ser. No. 413,169
Int. Cl.³ H01L 23/02
U.S. Cl. 428—615 8 Claims



1. A flat pack carrier for housing electronic components comprising a sandwich of a frame of nickel, cobalt, and iron, a first braze layer, a copper ring, a second braze layer, and a base of an alloy of tungsten and copper, said flat pack carrier having been formed in a brazing step which includes the steps of providing a sandwich structure of a frame, a braze, a ring, a braze and a copper tungsten alloy base, raising the temperature of said sandwich structure to the melting point of the braze having the highest melting point, and cooling said sandwich structure below the melting point of the braze having the lowest melting point such that the frame is brazed to the ring, such that the ring is brazed to the base, and such that the braze does not flash out over the base during brazing due to the higher thermal conductivity of said ring and base and because the base and ring reach the same temperature at substantially the same time during the brazing process.

4,451,541

SOLDERING COMPOSITION AND METHOD OF USE

Roy E. Beal, Naperville, Ill., assignor to Copper Development Association, Inc., Birmingham, Mich.

Continuation of Ser. No. 193,596, Sep. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 97,950, Nov. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 24,001, Mar. 26, 1979, abandoned. This application Jan. 7, 1983, Ser. No. 456,517
Int. Cl.³ B23K 35/28; B32B 15/01
U.S. Cl. 428—658 20 Claims

1. A zinc-based composition useful for soldering or joining copper or copper alloy surfaces comprising from 0 to about 3.0% copper, from about 0.3 to about 3.0% chromium, from about 0.3 to about 3.0% titanium, from 0 to about 5.0% nickel, from about 0.01 to about 1.0% lead, from about 0.01 to about 20% tin, and the balance zinc, said composition being essentially free of cadmium and containing less than 1% manganese and no more than very minor amounts of aluminum.

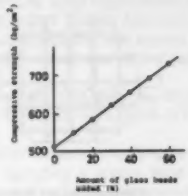
9. An article of manufacture comprising a plurality of copper or copper alloy surfaces joined by a zinc-based composition as the soldering material comprised of from 0 to about 3.0% copper, 0 to about 3.0% chromium, 0 to about 3.0% titanium, 0 to about 5.0% nickel, from about 0.01 to about 5.0% lead, from about 0.01 to about 20% tin and the balance zinc.

4,451,542

CELL WITH GASKET COMPRISING GLASS BEADS

Osamu Ishida; Yoshio Uetani, and Seiichi Matsushima, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Dec. 8, 1981, Ser. No. 328,665
Claims priority, application Japan, Dec. 8, 1980, 55-172891
Int. Cl.³ H01M 2/08
U.S. Cl. 429—174 9 Claims



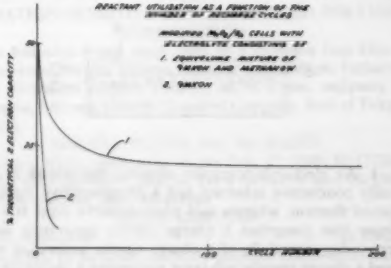
1. A cell comprising in combination:
a positive can having an opening defined by a lateral circumferential edge for receiving an electrolyte,
a negative collector having a peripheral portion fitted in said opening of said positive can defining a space between said peripheral portion and said lateral circumferential edge of said positive can, and
a gasket means set in said space between said lateral edge of said positive can and said peripheral portion of said negative collector so as to prevent the leakage of said electrolyte from said cell, said gasket comprising a synthetic resin composition including galss beads having an average particle size of 2 to 60 μm in an amount of from 5 to 50% by weight of said composition.

4,451,543

RECHARGEABLE ZINC/MANGANESE DIOXIDE CELL

Matthew A. Dzieciuch, Dearborn Heights; Halina S. Wroblowa, West Bloomfield, and Joseph T. Kummer, Ypsilanti, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 29, 1983, Ser. No. 537,206
Int. Cl.³ H01M 6/04
U.S. Cl. 429—206 2 Claims

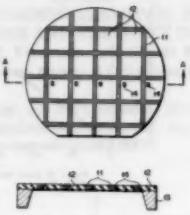

REACTANT UTILIZATION AS A FUNCTION OF THE NUMBER OF DISCHARGE CYCLES
MODIFIED MnO2/O2 CELLS WITH ELECTROLYTE CONSISTING OF
1. EQUIVOLUME MIXTURE OF WATER AND METHANOL
2. WATER
% THEORETICAL ELECTRON CAPACITY
100
CYCLE NUMBER
200

1. A rechargeable cell which is characterized by:
a positive electrode formed from a manganese oxide electrode material which contains a heavy metal selected from the group consisting of lead, bismuth, and mixtures of bismuth and lead;
a negative electrode of zinc;
a separator between said positive electrode and said negative electrode; and
an alkaline electrolyte consisting essentially of an organic alcohol material and an alkaline hydroxide in contact with both said positive electrode and said negative electrode.

4,451,544
MASK STRUCTURE FOR X-RAY LITHOGRAPHY AND METHOD FOR MANUFACTURING THE SAME

Katsuhiro Kawabuchi, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 17, 1982, Ser. No. 389,388
Claims priority, application Japan, Jun. 24, 1981, 56-97705
Int. Cl.³ G03F 9/00
U.S. Cl. 430—5 11 Claims

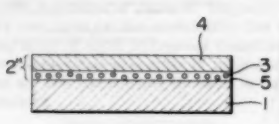


1. A mask structure for X-ray lithography, comprising;
a mask substrate of an X-ray transmitting material;
a lattice-shaped metal film for reinforcing said mask substrate, and which is embedded in a lattice-shaped slit formed corresponding to the positions of the dicing lines of the mask structure;
a mask pattern of an X-ray absorbing material which is formed on one of a surface of said mask substrate and in said substrate, and in the area surrounded by said lattice-shaped metal film; and
a support ring for supporting a rear periphery of said mask substrate.

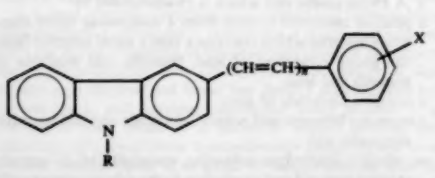
4,451,545
ELECTROPHOTOGRAPHIC ELEMENT WITH CARBAZOLE DERIVATIVE

Mitsuru Hashimoto, and Kiyoshi Sakai, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,401
Claims priority, application Japan, Oct. 3, 1981, 56-157883
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—59 18 Claims



1. An electrophotographic element comprising an electrically conductive substrate and a photosensitive layer superposed thereon, wherein said photosensitive layer is a double layer that comprises a charge carrier generating sub-layer consisting essentially of a charge carrier generating material and a charge transfer sub-layer containing a carbazole derivative compound having the following formula (I):



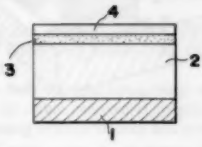
(I)

wherein R is lower alkyl; X is hydrogen, lower alkyl, lower alkoxy, amino or amino substituted with lower alkyl or benzyl; and n is 1 or 2.

4,451,546
PHOTOSENSITIVE MEMBER

Takao Kawamura, Senboku Seiwadai Koporasu 717-Go, 398-1, Tsujino, Sakai-Shi, Osaka-Fu, and Masazumi Yoshida, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha; Takao Kawamura, both of Osaka and Kyocera Corporation, Kyoto, all of, Japan

Filed Mar. 7, 1983, Ser. No. 473,004
Claims priority, application Japan, Mar. 31, 1982, 57-54567
Int. Cl.³ G03G 5/08, 5/14, 5/024
U.S. Cl. 430—69 4 Claims

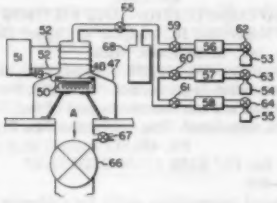


1. A photosensitive member which comprises an electrically conductive substrate, an amorphous silicon semiconductor layer, an amorphous silicon-germanium photoconductive layer having a thickness of about 0.1 to 3 microns and an amorphous silicon photoconductive layer having a thickness of about 0.1 to 3 microns.

4,451,547
ELECTROPHOTOGRAPHIC α-Si(H) MEMBER AND PROCESS FOR PRODUCTION THEREOF

Yutaka Hirai, Tokyo; Toshiyuki Komatsu, Kawasaki; Katsumi Nakagawa, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 971,114, Dec. 19, 1978, Pat. No. 4,265,991.
This application Dec. 8, 1980, Ser. No. 214,045
Claims priority, application Japan, Dec. 22, 1977, 52-154629; Jan. 23, 1978, 53-5958
Int. Cl.³ G03G 5/082
U.S. Cl. 430—128 21 Claims



1. A process for preparing an electrophotographic photosensitive member comprising a substrate for electrophotography and a photoconductive layer comprising amorphous silicon and containing an effective amount of hydrogen to provide high dark resistance and high SN ratio for electrophotographic processing, which comprises:
(a) subjecting a substrate suitable for electrophotography to a reduced pressure in an evacuable system,
(b) introducing gaseous material containing sources of silicon and hydrogen into said system under said reduced pressure,
(c) causing an electrical discharge in said gaseous material so as to form a photoconductive layer comprising hydroge-

nated amorphous silicon on the substrate wherein the temperature of said substrate is maintained with the range from 50° to 350° C., and,

(d) after said layer is formed, maintaining the layer under reduced pressure until the temperature of the substrate drops to or below a predetermined temperature.

4,451,548

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

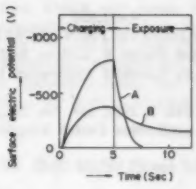
Akira Kinoshita; Osamu Sasaki; Kiyoshi Sawada, and Satoshi Goto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,889

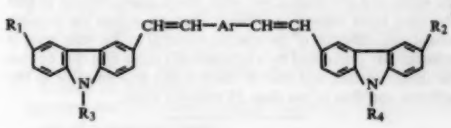
Claims priority, application Japan, Mar. 13, 1981, 56-36167

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—79 **11 Claims**



1. An electrophotographic photoreceptor comprising, a light sensitive layer on a conductive support, said light sensitive layer containing a carrier generation material and a carrier transport material comprising a carbazole derivative represented by formula I:



I

where each of R_1 and R_2 represents a hydrogen, a halogen, a hydroxy group, a substituted or unsubstituted alkyl group, an alkoxy group, an aryloxy group, a substituted amino group, or a substituted or unsubstituted aryl group; each of R_3 and R_4 represents a substituted or unsubstituted aryl group; and Ar represents a substituted or unsubstituted arylene group, or a divalent heterocyclic aromatic group, except pyridine.

4,451,549

LAMINATED PHOTOSENSITIVE PLATE FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Yoshiaki Kato, Hirakata, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 233,688, Feb. 12, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,675

Claims priority, application Japan, Feb. 13, 1980, 55-15515

Int. Cl.³ G03G *5/06*

U.S. Cl. 430—134 **5 Claims**

1. A process for the preparation of laminated photosensitive plates for electrophotography, which comprises coating on a conductive substrate a coating composition formed by dissolving a vinyl pyrrolidone type polymer and an electron-receptive substance in a halogenated aliphatic hydrocarbon solvent and dispersing a photoconductive organic pigment in the solution, drying the coated composition to form a layer comprised of a matrix comprising the vinyl pyrrolidone type polymer and the electron-receptive substance and the photoconductive organic pigment dispersed in the matrix, coating on the so-formed layer a solution of polymer of N-vinyl carbazole or a derivative thereof an electron-donative polymer in a solvent selected from the group consisting of cyclic ethers, halogenated aromatic hydrocarbons and aromatic hydrocarbon/ketone mixed solvents, and drying the coated solution to form a layer of the electron-donative polymer.

4,451,550

VESICULAR FILM AND COMPOSITION WITH PHENOXY RESIN MATRIX

Everett W. Bennett, Longmeadow, and Ahmad Arfaei, Holyoke, both of Mass., assignors to James River Graphics, Inc., South Hadley, Mass.

Filed Jul. 29, 1982, Ser. No. 403,108

Int. Cl.³ G03C *1/52, 1/60, 1/72*

U.S. Cl. 430—176 **33 Claims**

1. In a vesicular film element comprising a film support and a coating therefor including a matrix resin and an imaging amount of a photosensitive vesiculating agent adapted to generate gas vescicles upon exposure to radiation and subsequent heat-actuated development, the improvement which comprises, as the matrix resin for the photosensitive vesiculating agent, a coatable, highly branched, ungelled, monofunctional comonomer endblocked, non-linear phenoxy resin of random structure devoid of regularly recurring units, with the average distance between the branch sites thereof being essentially of the same order of magnitude as the average branch length.

31. A composition of matter comprising a phenoxy matrix resin and an imaging amount of a photosensitive vesiculating agent adapted to generate gas vesicles upon exposure to radiation and subsequent heat-actuated development, wherein the phenoxy resin comprises the non-linear, ungelled, highly long-chain branched reaction product of

(i) at least one dihydric phenol,

(ii) an epoxy compound having two epoxy groups,

(iii) an epoxy or phenolic branching agent having a functionality greater than 2,

wherein the amount of branching agent employed is sufficient to provide at least 10 mole percent branch sites in the polymer resin, and

(iv) a monofunctional phenol or epoxide as an endblocker compound.

4,451,551

RADIATION-SENSITIVE POLY(AMIC ACID) POLYMER COMPOSITION

Fumio Kataoka; Fusaji Shoji, both of Yokohama; Isao Obara, Kamakura; Hitoshi Yokono, Katsuta; Tokio Isogai, Fujisawa, and Mitumasa Kojima, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, both of Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,875

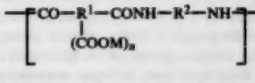
Claims priority, application Japan, Dec. 17, 1980, 55-177200; Jun. 24, 1981, 56-96489; Jun. 24, 1981, 56-96493; Jun. 24, 1981, 56-96494; Oct. 19, 1981, 56-165806

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **21 Claims**

1. A light- or radiation-sensitive polymer composition comprising

(a) a poly(amic acid) having as a major component a repeating unit of the formula:



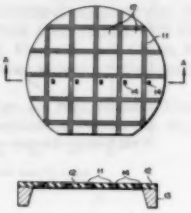
(I)

wherein R^1 is a trivalent or tetravalent organic group having at least 2 carbon atoms; R^2 is a divalent organic group having at least 2 carbon atoms; M is hydrogen or an ammonium ion; and n is an integer of 1 or 2, and

4,451,544
MASK STRUCTURE FOR X-RAY LITHOGRAPHY AND METHOD FOR MANUFACTURING THE SAME

Katsuhiro Kawabuchi, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 17, 1982, Ser. No. 389,388
Claims priority, application Japan, Jun. 24, 1981, 56-97705
Int. Cl.³ G03F 9/00
U.S. Cl. 430—5 11 Claims

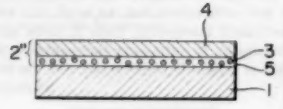


1. A mask structure for X-ray lithography, comprising;
a mask substrate of an X-ray transmitting material;
a lattice-shaped metal film for reinforcing said mask substrate, and which is embedded in a lattice-shaped slit formed corresponding to the positions of the dicing lines of the mask structure;
a mask pattern of an X-ray absorbing material which is formed on one of a surface of said mask substrate and in said substrate, and in the area surrounded by said lattice-shaped metal film; and
a support ring for supporting a rear periphery of said mask substrate.

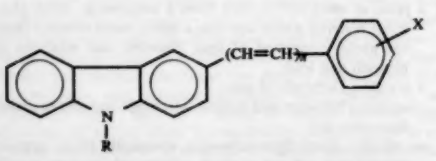
4,451,545
ELECTROPHOTOGRAPHIC ELEMENT WITH CARBAZOLE DERIVATIVE

Mitsuru Hashimoto, and Kiyoshi Sakai, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,401
Claims priority, application Japan, Oct. 3, 1981, 56-157883
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—59 18 Claims



1. An electrophotographic element comprising an electrically conductive substrate and a photosensitive layer superposed thereon, wherein said photosensitive layer is a double layer that comprises a charge carrier generating sub-layer consisting essentially of a charge carrier generating material and a charge transfer sub-layer containing a carbazole derivative compound having the following formula (I):



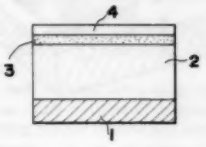
(I)

wherein R is lower alkyl; X is hydrogen, lower alkyl, lower alkoxy, amino or amino substituted with lower alkyl or benzyl; and n is 1 or 2.

4,451,546
PHOTOSENSITIVE MEMBER

Takao Kawamura, Senboku Seiwadai Koporasu 717-Go, 398-1, Tsujino, Sakai-Shi, Osaka-Fu, and Masazumi Yoshida, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha; Takao Kawamura, both of Osaka and Kyocera Corporation, Kyoto, all of, Japan

Filed Mar. 7, 1983, Ser. No. 473,004
Claims priority, application Japan, Mar. 31, 1982, 57-54567
Int. Cl.³ G03G 5/08, 5/14, 5/024
U.S. Cl. 430—69 4 Claims

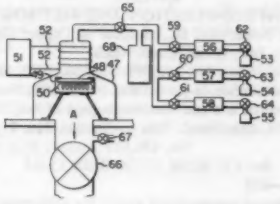


1. A photosensitive member which comprises an electrically conductive substrate, an amorphous silicon semiconductor layer, an amorphous silicon-germanium photoconductive layer having a thickness of about 0.1 to 3 microns and an amorphous silicon photoconductive layer having a thickness of about 0.1 to 3 microns.

4,451,547
ELECTROPHOTOGRAPHIC α-Si(H) MEMBER AND PROCESS FOR PRODUCTION THEREOF

Yutaka Hirai, Tokyo; Toshiyuki Komatsu, Kawasaki; Katsumi Nakagawa, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 971,114, Dec. 19, 1978, Pat. No. 4,265,991.
This application Dec. 8, 1980, Ser. No. 214,045
Claims priority, application Japan, Dec. 22, 1977, 52-154629; Jan. 23, 1978, 53-5958
Int. Cl.³ G03G 5/082
U.S. Cl. 430—128 21 Claims



1. A process for preparing an electrophotographic photosensitive member comprising a substrate for electrophotography and a photoconductive layer comprising amorphous silicon and containing an effective amount of hydrogen to provide high dark resistance and high SN ratio for electrophotographic processing, which comprises:
(a) subjecting a substrate suitable for electrophotography to a reduced pressure in an evacuable system,
(b) introducing gaseous material containing sources of silicon and hydrogen into said system under said reduced pressure,
(c) causing an electrical discharge in said gaseous material so as to form a photoconductive layer comprising hydroge-

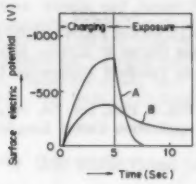
nated amorphous silicon on the substrate wherein the temperature of said substrate is maintained with the range from 50° to 350° C., and,

(d) after said layer is formed, maintaining the layer under reduced pressure until the temperature of the substrate drops to or below a predetermined temperature.

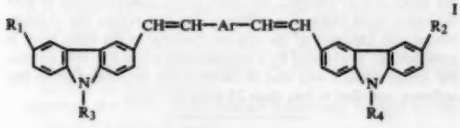
4,451,548
ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Akira Kinoshita; Osamu Sasaki; Kiyoshi Sawada, and Satoshi Goto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,889
Claims priority, application Japan, Mar. 13, 1981, 56-36167
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—79 **11 Claims**



1. An electrophotographic photoreceptor comprising, a light sensitive layer on a conductive support, said light sensitive layer containing a carrier generation material and a carrier transport material comprising a carbazole derivative represented by formula I:



I

where each of R_1 and R_2 represents a hydrogen, a halogen, a hydroxy group, a substituted or unsubstituted alkyl group, an alkoxy group, an aryloxy group, a substituted amino group, or a substituted or unsubstituted aryl group; each of R_3 and R_4 represents a substituted or unsubstituted aryl group; and Ar represents a substituted or unsubstituted arylene group, or a divalent heterocyclic aromatic group, except pyridine.

4,451,549
LAMINATED PHOTOSENSITIVE PLATE FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Yoshiaki Kato, Hirakata, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 233,688, Feb. 12, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,675
Claims priority, application Japan, Feb. 13, 1980, 55-15515
Int. Cl.³ G03G 5/06
U.S. Cl. 430—134 **5 Claims**

1. A process for the preparation of laminated photosensitive plates for electrophotography, which comprises coating on a conductive substrate a coating composition formed by dissolving a vinyl pyrrolidone type polymer and an electron-receptive substance in a halogenated aliphatic hydrocarbon solvent and dispersing a photoconductive organic pigment in the solution, drying the coated composition to form a layer comprised of a matrix comprising the vinyl pyrrolidone type polymer and the electron-receptive substance and the photoconductive organic pigment dispersed in the matrix, coating on the so-formed layer a solution of polymer of N-vinyl carbazole or a derivative thereof an electron-donative polymer in a solvent selected from the group consisting of cyclic ethers, halogenated aromatic hydrocarbons and aromatic hydrocarbon/ketone mixed solvents, and drying the coated solution to form a layer of the electron-donative polymer.

4,451,550
VESICULAR FILM AND COMPOSITION WITH PHENOXY RESIN MATRIX

Everett W. Bennett, Longmeadow, and Ahmad Arfaei, Holyoke, both of Mass., assignors to James River Graphics, Inc., South Hadley, Mass.

Filed Jul. 29, 1982, Ser. No. 403,108
Int. Cl.³ G03C 1/52, 1/60, 1/72
U.S. Cl. 430—176 **33 Claims**

1. In a vesicular film element comprising a film support and a coating therefor including a matrix resin and an imaging amount of a photosensitive vesiculating agent adapted to generate gas vescicles upon exposure to radiation and subsequent heat-actuated development, the improvement which comprises, as the matrix resin for the photosensitive vesiculating agent, a coatable, highly branched, ungelled, monofunctional comonomer endblocked, non-linear phenoxy resin of random structure devoid of regularly recurring units, with the average distance between the branch sites thereof being essentially of the same order of magnitude as the average branch length.

31. A composition of matter comprising a phenoxy matrix resin and an imaging amount of a photosensitive vesiculating agent adapted to generate gas vesicles upon exposure to radiation and subsequent heat-actuated development, wherein the phenoxy resin comprises the non-linear, ungelled, highly long-chain branched reaction product of

(i) at least one dihydric phenol,

(ii) an epoxy compound having two epoxy groups,

(iii) an epoxy or phenolic branching agent having a functionality greater than 2,

wherein the amount of branching agent employed is sufficient to provide at least 10 mole percent branch sites in the polymer resin, and

(iv) a monofunctional phenol or epoxide as an endblocker compound.

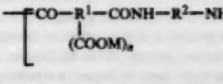
4,451,551
RADIATION-SENSITIVE POLY(AMIC ACID) POLYMER COMPOSITION

Fumio Kataoka; Fusaji Shoji, both of Yokohama; Isao Obara, Kamakura; Hitoshi Yokono, Katsuta; Tokio Isogai, Fujisawa, and Mitumasa Kojima, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, both of Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,875
Claims priority, application Japan, Dec. 17, 1980, 55-177200; Jun. 24, 1981, 56-96489; Jun. 24, 1981, 56-96493; Jun. 24, 1981, 56-96494; Oct. 19, 1981, 56-165806
Int. Cl.³ G03C 1/68
U.S. Cl. 430—270 **21 Claims**

1. A light- or radiation-sensitive polymer composition comprising

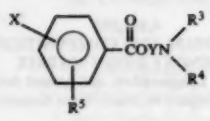
(a) a poly(amic acid) having as a major component a repeating unit of the formula:



(I)

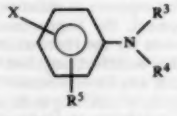
wherein R^1 is a trivalent or tetravalent organic group having at least 2 carbon atoms; R^2 is a divalent organic group having at least 2 carbon atoms; M is hydrogen or an ammonium ion; and n is an integer of 1 or 2, and

(b) one or more light- or radiation-sensitive compounds having an amino group and an aromatic azide group or aromatic sulfonylazide group in one molecule selected from the group consisting of a compound of the formula:



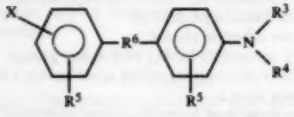
(2)

wherein X is $-N_3$ or $-SO_2N_3$; Y is an alkylene group; and R^3, R^4 and R^5 are independently hydrogen or a lower alkyl group; a compound of the formula:



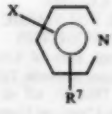
(3)

wherein X is $-N_3$ or $-SO_2N_3$; and R^3, R^4 and R^5 are independently hydrogen or a lower alkyl group; a compound of the formula:



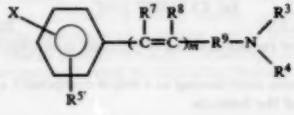
(4)

wherein X is $-N_3$ or $-SO_2N_3$; R^3, R^4 and R^5 are independently hydrogen or a lower alkyl group; a compound of the formula:



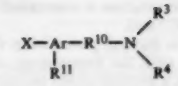
(5)

wherein X is $-N_3$ or $-SO_2N_3$; and R^7 is hydrogen or a lower alkyl group; a compound of the formula:



(6)

wherein X is $-N_3$ or $-SO_2N_3$; R^3 and R^4 are independently hydrogen or a lower alkyl group; $R^{5'}$ is hydrogen, halogen, a nitro group, a lower alkoxy group, a lower alkyl group or a cyano group; R^7 is hydrogen or a lower alkyl group; R^8 is hydrogen, halogen, a cyano group or a lower alkyl group; R^9 is a divalent organic group bonding to the N atom and the moiety having an unsaturated bonding; and m is an integer of 1 to 3; and a compound of the formula:



(7)

wherein X is $-N_3$ or $-SO_2N_3$; Ar is an aromatic group selected from a benzene ring which may be fused one and a heterocyclic ring; R^3 and R^4 are independently hydrogen or a lower alkyl group; R^{10} is a divalent organic group bonding to the Ar and the N atom; and R^{11} is hydrogen, halogen, a lower alkyl group, a lower alkoxy group, a nitro group, a carboxyl group, or a sulfonic acid group; in an amount of 0.05 to 5 times the equivalent of the total COOM groups of the repeating units of the formula (1) of component (a).

4,451,552

FORMATION OF PRINT SURFACES

Alan R. Gamsoe, and Phillip R. Kellner, both of London, England, assignors to Crosfield Electronics Limited, London, England

Filed Feb. 5, 1982, Ser. No. 346,324

Claims priority, application United Kingdom, Feb. 6, 1981, 8103775

Int. Cl.³ G03F 7/02

U.S. Cl. 430—302 **11 Claims**

1. A process for forming a print surface from a layer of photocurable resin by holding against the resin layer a photomask comprising a transparent sheet carrying an image surface that is in contact with the resin layer and that comprises an image-wise distribution of opaque material bonded to the sheet by an organic binder, illuminating the sheet and thereby subjecting the resin layer to image-wise photoexposure, removing the sheet and developing the resin layer, characterised in that the resin layer releases a softener that can soften the organic binder and adhesion of the opaque material to the resin layer is substantially prevented by a substantially clear film that covers the image surface and that is substantially impermeable to the softener and that is less than 25 microns thick.

4,451,553

HALOGEN FINISHING OF FLEXOGRAPHIC PRINTING PLATES CONTAINING BUTADIENE/ACRYLONITRILE COPOLYMERS

Michael G. Fickes, Colts Neck, and Bohdan Rakoczy, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 386,910, Jun. 10, 1982, abandoned. This application Mar. 4, 1983, Ser. No. 472,103

Int. Cl.³ G03C 5/00

U.S. Cl. 430—306 **9 Claims**

1. A process for providing an improved solvent resistant surface to a relief photosensitive flexographic printing plate wherein the areas in relief are prepared by imagewise exposure with actinic radiation and liquid development of unexposed areas of a layer of a photosensitive, elastomeric composition comprising a high molecular weight butadiene/acrylonitrile copolymer having a number average molecular weight of 20,000 to 75,000, an acrylonitrile content of 10 to 50% by weight and a carboxyl content of 0 to 15% by weight and a nongaseous ethylenically unsaturated compound containing at least one terminal ethylenic group, the process comprising, in either order,

(1) postexposing the developed surface to a source of actinic radiation, and

(2) contacting the developed surface in succession with two aqueous halogen solutions, the first halogen solution being either an aqueous solution having a free bromine concentration of 0.01 to 3.5% by weight, with contact for about 15 seconds to 20 minutes, or an aqueous solution having a

free iodine concentration of 0.2 to 10% by weight, with contact for about 1.0 to 10 minutes, followed by the second halogen solution of chlorine equivalent to that supplied by an aqueous solution, 0.01 to 1.0 molar in NaOCl and 0.012 to 1.2 molar in HCl, with contact for about 15 seconds to 5 minutes.

4,451,554

METHOD OF FORMING THIN-FILM PATTERN

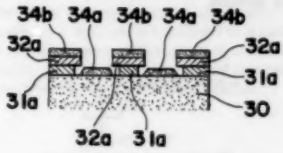
Kohhei Kishi, Nara; Hiroaki Kato; Masataka Matsuura, both of Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Japan Electronic Industry Development Association, Tokyo, both of, Japan

Continuation of Ser. No. 205,879, Nov. 10, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,325

Claims priority, application Japan, Nov. 9, 1979, 54-145760

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 430—313 4 Claims



1. A method suited for the manufacture of a thin-film transistor or a thin-film capacitor which comprises the steps of:

forming a first metal coating on a surface of a substrate;

forming a photo resist coating on the first metal coating formed on the substrate;

exposing the photo resist coating selectively to light by the use of a patterned mask;

developing a portion of the photo resist coating which has not been exposed to light to form in an imagewise configuration a photo resist layer resting on the first metal coating;

immersing the substrate into a first etchant bath to remove that portion of the first metal coating which is uncovered by the photo resist layer and to produce an undercut area beneath said photo resist coating in the still covered areas, thereby leaving a first metal layer between the photo resist layer and the substrate with a portion of the photo resist layer protruding beyond the remaining portion of the first metal coating to produce an umbrella effect;

forming second metal layers to a thickness smaller than the thickness of the first metal coating on the top of the photo resist layer and also in an imagewise configuration on a portion of the substrate surface around the first metal layer in those areas from which the portion of the first metal coating was initially removed such that said second metal image configuration is discontinuous with said first metal coating beneath said photo resist and has sloping sides;

contacting the substrate with a solvent to remove the photo resist layer together with the second metal layer formed on the top thereof; and

immersing the substrate into a second etchant bath to remove that portion of the first metal layer originally formed and still remaining on the substrate surface while not etching the second metal which has been deposited in an imagewise configuration.

4,451,555

ANTIFOGGING COMPOUNDS AND THEIR USE IN SILVER HALIDE PHOTOGRAPHY

Robert J. Pollet, Vremde; Antoon L. Vandenberghe, Hove, and Roger A. Spriet, Edegem, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Nov. 25, 1981, Ser. No. 324,805

Claims priority, application United Kingdom, Dec. 9, 1980, 8039457

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—445 8 Claims

1. A photographic material comprising one or more hydrophilic colloid layers including at least one silver halide emulsion layer, at least one of said layers containing in an amount sufficient to inhibit fog a 1-phenyl-5-mercaptotetrazole compound or a precursor thereof, wherein the phenyl group bears a substituent comprising at least one thioether function.

4,451,556

TELLURIUM IMAGING COMPOSITION INCLUDING BASE

Terry T. Yu, Mt. Clemens, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 28, 1982, Ser. No. 392,579

Int. Cl.³ G03C *5/24*

U.S. Cl. 430—346 55 Claims

1. A film for forming an image made from an image forming composition which image forming composition comprises:

(a) a tellurium imaging compound;

(b) a reductant precursor which will abstract labile hydrogen from a hydrogen donor under the influence of activating radiation to become a reducing agent with respect to the image forming tellurium compound;

(c) a masked reducing agent which ionizes under the influence of a base;

(d) a source of labile hydrogen for reaction with said reductant precursor;

(e) an inorganic base which is capable of ionizing the masked reducing agent, said base being present in an amount of ionize at least a portion of the masked reducing agent present in the composition; and

(f) a matrix in which said tellurium compound, reductant precursor, masked reducing agent, source of labile hydrogen and base are combined in amounts effective to form a composition which may be applied to a substrate.

4,451,557

PHOTOGRAPHIC SPEED INCREASING AND LATENT IMAGE STABILIZING COMPOUNDS, SILVER HALIDE EMULSIONS, AND PHOTOGRAPHIC ELEMENTS

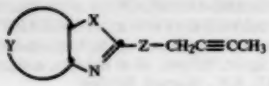
Roger Lok, Hilton; John P. Freeman, Rochester, and William N. Baum, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,794, Nov. 12, 1981, Pat. No. 4,378,426. This application Feb. 14, 1983, Ser. No. 466,244

Int. Cl.³ G03C *1/46, 1/06*

U.S. Cl. 430—505 16 Claims

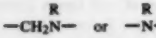
11. In a color photographic element comprising a support bearing at least one blue-sensitive silver halide emulsion layer having associated therewith a yellow dye-forming coupler, at least one green-sensitive silver halide emulsion layer having associated therewith a magenta dye-forming coupler, and at least one red-sensitive silver halide emulsion layer having associated therewith a cyan dye-forming coupler, the improvement wherein at least one of the silver halide emulsion layers contains a latent image stabilizing amount of a compound represented by the formula:



wherein:

X and Y complete a heterocyclic nucleus chosen from the class consisting of benzoxazole, benzothiazole, benzoselenazole, and benzimidazole;

Z is



and

R is hydrogen or lower alkyl.

4,451,558

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hiroshi Sugita; Satoshi Kawakatsu, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,270

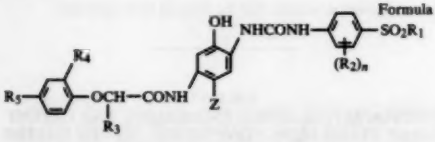
Claims priority, application Japan, Jun. 10, 1982, 57-100087

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—546 **11 Claims**

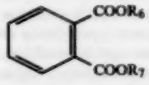
1. A silver halide color photographic light-sensitive material comprising a support provided thereon a hydrophilic colloidal layer containing at least one kind of phenol cyan coupler having the Formula [I] in which an ureido radical is 2-position and being dispersed by making use of a phthalic ester having the Formula [II]:

Formula [I]



wherein R_1 represents a straight or branched alkyl, cycloalkyl radical, R_2 represents a hydrogen atom, a halogen atom or a monovalent organic radical, R_3 represents a straight or branched alkyl radical, R_4 and R_5 each represents a branched alkyl radical, Z represents a hydrogen atom or a radical capable of eliminating in a coupling reaction with an oxidation product of a color developing agent, n represents an integer of 0 to 3;

Formula [II]



wherein R_6 and R_7 each represent an alkyl, alkenyl, aryl or cycloalkyl radical.

4,451,559

SILVER HALIDE PHOTOSENSITIVE MATERIALS FOR COLOR PHOTOGRAPHY

Ryosuke Sato; Katsunori Kato; Takashi Sasaki, and Hiroshi Sugita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

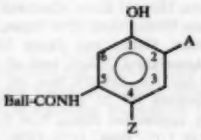
Continuation of Ser. No. 385,096, Jun. 4, 1982, abandoned. This application Aug. 12, 1983, Ser. No. 522,818

Claims priority, application Japan, Jun. 11, 1981, 56-90334; Jun. 11, 1981, 56-90335; Jun. 11, 1981, 56-90336

Int. Cl.³ G03C *7/26*

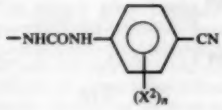
U.S. Cl. 430—552 **3 Claims**

1. A silver halide photosensitive material for color photography which comprises a phenol type cyan coupler having the formula

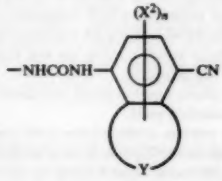


wherein

A has the formula



or



X^2 is an alkyl group, a halogen atom, a hydroxyl group, a nitro group, an acyloxy group, an alkoxy group or an acyl group;

Y is a non-metallic group forming a 5- or 6-membered condensed ring;

Z is a hydrogen atom or a removable group upon coupling reaction with an oxidized product of a color developing agent;

Ball is a ballast group; and

n is an integer of 1 to 4 inclusive.

4,451,560

CHEMICAL SENSITIZATION OF SILVER HALIDE GRAINS

Arthur M. Gerber, Belmont, and Judith Loucks, Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 15, 1982, Ser. No. 441,687

Int. Cl.³ G03C *1/28*

U.S. Cl. 430—567 **33 Claims**

1. A method for forming a photosensitive element which comprises contacting silver halide in a plurality of spaced depressions in a surface with a mixture of a silver halide solvent and a chemically sensitized fine-grain silver halide emulsion, thereby forming a chemically sensitized single effective silver halide grain in substantially each depression.

4,451,561
HEAT-DEVELOPMENT-TYPE IMAGE RECORDING MATERIAL

Shigeto Hirabayashi, Hachioji; Toyoaki Masukawa, Hinode; Wataru Ishikawa, Hachioji, and Tetsuya Harada, Chofu, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 22, 1983, Ser. No. 487,729
Claims priority, application Japan, Apr. 28, 1982, 57-73215
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—619 **10 Claims**

1. A heat-development-type image recording material comprising on a support a heat-development-type image recording layer containing

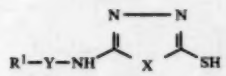
(a) an organic silver salt,

(b) a reducing agent,

(c) a binder, and

(d) at least one compound of following formula [I]:

Formula [I]

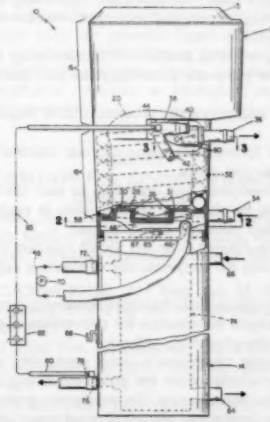


wherein R^1 represents a hydrogen atom, a hydroxy radical or a substituted or unsubstituted alkyl, alkenyl, aryl or alkoxy radical; Y represents a sulfonyl or a carbonyl radical; and X represents a sulfur atom or $=N-R^2$ wherein R^2 is a hydrogen atom, an amino radical or a substituted or unsubstituted alkyl, aryl or alkenyl radical.

4,451,562
BLOOD OXYGENATOR

Roger J. Elgas, Littleton, and Timothy M. Gordon, Morrison, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 26, 1982, Ser. No. 371,973
Int. Cl.³ A61M *1/03*
U.S. Cl. 435—2 **8 Claims**



1. Blood oxygenating apparatus comprising

a fluid flow mass transfer device including a microporous membrane sealed to the interior surface of a housing to define a plurality of parallel blood and air channels separated by said membrane, blood inflow and outflow ports communicating with said blood channels, and air inflow and outflow ports communicating with said air channels, said blood inflow port communicating with the upper end of said membrane,

said blood outflow port communicating with the lower end of said membrane,

a support holding said device with said blood inflow port located above said blood outflow port to cause any air bubbles introduced into said blood inflow port to have, owing to their buoyancy, a velocity through said blood channels that is slower than the bulk flow of blood flowing through said blood channels,

means to supply air to said air inflow port at a first pressure, and

pumping means to supply blood to said blood inflow port at a pressure sufficiently higher than said first pressure to cause substantially all said bubbles to completely pass through the pores of said microporous membrane to the air side of the membrane prior to being carried to the blood outlet port by the flow of blood.

5. A method of oxygenating blood comprising

providing a fluid flow mass transfer device including a microporous membrane sealed to the interior surface of a housing to define a plurality of parallel blood and air channels separated by said membrane, blood inflow and outflow ports communicating with said blood channels, and air inflow and outflow ports communicating with said air channels, said blood inflow port communicating with the upper end of said membrane, said blood outflow port communicating with the lower end of said membrane,

supporting said device with said blood inflow port located above said blood outflow port to cause and air bubbles introduced into said blood inflow port to have, owing to buoyancy, a velocity through said blood channels that is slower than the bulk flow of blood flowing through said channels,

supplying air to said air inlet port at a first pressure, and

pumping blood to said blood inlet port at a pressure sufficiently higher than said first pressure to cause substantially all said bubbles to completely pass through the pores of said microporous membrane to the air side of the membrane prior to being carried to the blood outflow port by the flow of blood.

4,451,563
METHOD FOR INCREASING THE SENSITIVITY OF ASSAYS

Richard A. Kaufman, 812 Stonegate La., Stanhope, N.J. 07874

Filed Aug. 28, 1981, Ser. No. 297,483
Int. Cl.³ C12Q *1/34, 1/38, 1/40, 1/42, 1/44, 1/54*
U.S. Cl. 435—21 **10 Claims**

1. In an enzymatic method for the kinetic analysis of biological fluids in which the hydrolysis of a nitrophenol indicator from its respective substrate is effected at or about neutral pH, the improvement comprising:

adding to said biological fluid a sensitization effective amount of cyclodextrin so as to effect a hypochromic shift in the wavelength in the unionized homologue of indicator compound thereby increasing the proportion of ionized homologue indicator in said biological fluid; and,

measuring the level of ionized indicator in the biological fluid at the absorbance maxima of said ionized indicator.

2. In an enzymatic method for the kinetic analysis of biological fluids for alkaline phosphatase in which the hydrolysis of a nitrophenol indicator from its respective substrate is effected at a pH which produces the optimum rate of hydrolysis, the improvement comprising:

adding to said biological fluid a sensitization effective amount of cyclodextrin so as to effect a shift in the absorbance maxima of the indicator and thereby reduce interference caused by the nitrophenol labeled substrate; and

measuring the level of indicator in the biological fluid at the absorbance maxima of said indicator.

3. In an enzymatic method for the analysis of biological fluids in which the hydrolysis of a nitrophenol indicator from its respective substrate produces a chromopore which has an absorbance maxima within a range of absorbance of interfer-

ring substances also present within said biological fluid, the improvement comprising:

adding to said biological fluid a sensitization effective amount of cyclodextrin so as to effect a shift in the absorbance maxima of the indicator and thereby reduce the interference caused by other substances within said fluid having appreciable absorbance within the same range of absorbance of the indicator compound prior to shift of its absorbance maxima by said cyclodextrin; and

measuring the level of indicator in the biological fluid at the absorbance maxima of said indicator.

4. In an enzymatic method for the kinetic analysis of biological fluids for amylase activity in which the enzymatic hydrolysis of a nitrophenol indicator from a nitrophenol oligoglycoside substrate produces a chromophore which can be correlated with the level of amylase activity in said biological fluid, the improvement comprising:

adding to said biological fluid a sensitization effective amount of cyclodextrin so as to effect an increase in the proportion of chromophore at the optimum pH for the conduct of such analysis; and

measuring the level of chromophore in the biological fluid at the absorbance maxima of said chromophore advantage.

4,451,564

TRANSFORMATION OF STEROLS BY FERMENTATION

Alfred Struve, Hilden; Frank F. Hill, Mettmann-Obschwarzbach, and Joachim Schindler, Hilden, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Düsseldorf, Fed. Rep. of Germany

Division of Ser. No. 183,622, Sep. 2, 1980, Pat. No. 4,374,776. This application Aug. 2, 1982, Ser. No. 404,456

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936125

Int. Cl.³ C12P *33/16*

U.S. Cl. 435—55 **6 Claims**

1. A process for preparing 17-C-steroid-α-propionic acid compounds which comprises the steps of:

(a) incubating and culturing a microorganism capable of selectively degrading side chains at the C-17 position of a steroid without substantially degrading the steroid rings and not degrading an α-propionic acid radical at said C-17 position in an aqueous culture medium; and

(b) adding to the aqueous culture medium from step (a) sterol concentrates obtained by distillation of residues of fat processing after transesterification with a lower alkanol and having a saponification number of 50 to 170 and an OH-number (unsaponified) of 40 to 150, comprising up to about 50 percent by weight of sterol compounds, up to about 50 percent by weight of methyl esters of fatty acids that are primarily hydroxylated, and small amounts of partial glycerides.

4,451,565

ENZYME-MEDIATED SYNTHESIS OF ESTERS AND LACTONES

Ian Gatfield, Hoexter, and Theodor Sand, Holzminden, both of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,519

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108927

Int. Cl.³ C12P *17/00, 7/00, 7/62*; C12R *1/785*

U.S. Cl. 435—117 **5 Claims**

1. In the enzyme-mediated synthesis of an ester or lactone of at least one carboxylic acid of the formula

$$R—CH_2—CH_2—COOH$$

wherein

R is a hydrogen atom, or a hydrocarbon radical which has 1 to 21 carbon atoms and which can be substituted by hydroxyl groups or alkoxyl groups with 1 to 10 carbon atoms, wherein such acid is reacted with at least one primary or secondary alcohol having from 1 to 15 carbon atoms in the presence of an esterase derived from Mucor miehei the improvement comprising effecting the reaction in the absence of water other than that formed in the reaction.

4,451,566

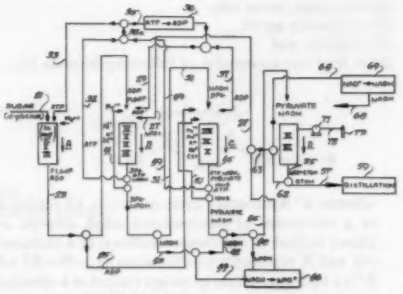
METHODS AND APPARATUS FOR ENZYMATICALLY PRODUCING ETHANOL

Donald B. Spencer, 2813 Wall St., Waukegan, Ill. 60085

Filed Dec. 4, 1981, Ser. No. 327,349

Int. Cl.³ C12P *7/14*

U.S. Cl. 435—162 **18 Claims**



1. A method of producing ethanol comprising

providing a first reaction zone containing an enzymatic protein selected from the group consisting of hexokinase and glucokinase plus the enzymatic proteins phosphoglucose isomerase and phosphofructokinase,

providing a second reaction zone containing the enzymatic proteins aldose, triose phosphate isomerase, glyceraldehyde-3-phosphate dehydrogenase, and phosphoglycerate kinase,

providing a third reaction zone containing the enzymatic proteins phosphoglyceromutase, enolase and pyruvate kinase,

providing a fourth reaction zone containing the enzymatic proteins pyruvate decarboxylase and alcohol dehydrogenase,

retaining said enzymatic proteins in their respective reaction zones,

passing a fermentable sugar solution successively through said reaction zones,

adding coenzymes and cofactors to said reaction zones as required for the enzymatic proteins in each zone to perform their catalytic functions, and

recovering ethanol from the fourth reaction zone.

18. A system for enzymatically converting sugar to ethanol comprising

a plurality of reaction chambers containing enzymatic proteins arranged in sequence for conversion of sugar to ethanol by the glycolytic pathway,

said reaction chambers in total containing an enzymatic protein selected from the group consisting of hexokinase and glucokinase, plus the enzymatic proteins phosphoglucose isomerase, phosphofructokinase, aldolase, triose phosphate isomerase, glyceraldehyde-3-phosphate dehydrogenase, phosphoglycerate kinase, phosphoglyceromutase, enolase, pyruvate kinase, pyruvate decarboxylase and alcohol dehydrogenase,

means for retaining said enzymatic proteins in each of said chambers,

the enzymatic proteins phosphoglucose isomerase and phosphofructokinase being grouped together in one chamber, the enzymatic proteins aldolase, triose phophate isomerase, glyceraldehyde-3-phosphate dehydrogenase and

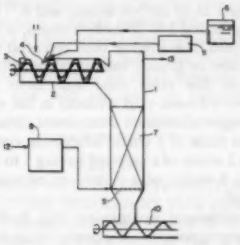
phosphoglycerate kinase being grouped together in another chamber and said enzymatic proteins phosphoglyceromutase, enolase and pyruvate kinase being grouped together in another chamber.

4,451,567

METHOD FOR PRETREATMENT OF CELLULOSIC MATERIALS

Tadashi Ishibashi; Masahiko Ishida, and Yoji Odawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,467
Claims priority, application Japan, Jul. 31, 1980, 55-104285
Int. Cl.³ C12P *19/14*
U.S. Cl. 435—170 **15 Claims**



1. A method for biologically or enzymatically converting lignocellulosic materials, which comprises wetting a lignocellulosic material with an alkaline aqueous solution of an alkali metal or alkaline earth metal compound and then contacting the wetted lignocellulosic material with ozone in the state of gas-solid contact, wherein the water content of said wetted lignocellulosic material is 10 to 80% by weight and the content of alkali metal or alkaline earth metal compound is 0.001 to 10% by weight based on the total weight of the alkaline aqueous solution and the cellulosic material, to make loose the lignin from the lignocellulosic material without the lignin going into solution, and wherein the wetted lignocellulosic material is contacted with ozone without the lignin, loosened by the treatment with the aqueous liquid of alkali metal or alkaline earth metal compound, having previously gone into solution, to decompose the loose lignin, and subjecting the treated lignocellulosic material to biological or enzymatic decomposition treatment.

4,451,568

COMPOSITION FOR BINDING BIOACTIVE SUBSTANCES

Michel Schneider, Troinex; Pierre Chevreux, Ferney-Voltaire, and Christian Guillot, Saint Nicolas le Vieux, all of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

PCT No. PCT/CH80/00138, 371 Date Jul. 13, 1981, 102(e) Date Jul. 13, 1981, PCT Pub. No. WO81/01412, PCT Pub. Date May 28, 1981
PCT Filed Nov. 13, 1980, Ser. No. 285,182
Int. Cl.³ C12N *11/06, 11/08*; E08F *2/46*
U.S. Cl. 435—181 **19 Claims**

1. An acrylic-acid-based photopolymerizable composition capable of binding bioactive substances after being photopolymerized comprising:

10 to 70 percent by weight of acrylic acid, and

(i) 0.5 to 10 percent by weight of at least one photoinitiator which is an aromatic ketone compound;

(ii) 0.5 to 15 percent by weight of at least one photopolymerization activator and adhesion promotor which is an amino-alcohol, acrylate, or methacrylate; and

(iii) an effective amount up to 50 percent by weight of at least one copolymerizable olefinic monomer having a double bond, which is copolymerizable with the acrylic acid and which has a reactive functional group capable of binding bioactive substances, said monomers being selected from the group consisting of N-hydroxysuccinimide acrylate, N-hydroxysuccinimide amidocaproate, epoxypropyl acrylate and 2-isocyanato-ethyl acrylate, said effective amount being an amount to provide sufficient reactive functional groups to bind said bioactive substances.

4,451,569

STABLE ENZYME COMPOSITION

Setsuo Kobayashi; Kazuo Beppu; Hiroshi Shimizu; Satoshi Ogawa, all of Otsu, and Ryotaro Kotani, Moriyama, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 1, 1982, Ser. No. 394,165
Claims priority, application Japan, Jul. 6, 1981, 56-106130
Int. Cl.³ C12N *9/96, 9/08*
U.S. Cl. 435—188 **8 Claims**

1. A stable enzyme composition in freeze-dried form comprising glutathione peroxidase and at least one stabilizer compound selected from the group consisting of pentoses, hexoses, pentahydric sugar alcohols, hexahydric sugar alcohols and disaccharides.

4,451,570

IMMUNOGLOBULIN-SECRETING HUMAN HYBRIDOMAS FROM A CULTURED HUMAN LYMPHOBLASTOID CELL LINE

Ivor Royston, La Jolla; Harold Handley, Cardiff; J. Edwin Seegmiller, La Jolla, and Linda F. Thompson, San Diego, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 26, 1981, Ser. No. 247,652
Int. Cl.³ C12N *5/00, 15/00, 5/02*; C12R *1/91*
U.S. Cl. 435—240 **2 Claims**

1. A HAT sensitive human lymphoblastoid B-cell line UC 729-6, ATCC-CRl 8061.

4,451,571

PREPARATION OF SAMPLES FOR VITAMIN B12 AND/OR FOLATE ASSAY AND ASSAY

Robert H. Allen, Englewood, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed Apr. 6, 1981, Ser. No. 251,249
Int. Cl.³ G01N *33/56, 33/82, 1/00*
U.S. Cl. 436—505 **23 Claims**

1. A composition for use in the preparation of a clinical sample for the determination of vitamin B_{12} or folate by competitive binding assay which comprises:

(A) a material in an amount sufficient to bind with endogenous vitamin B_{12} binding protein present in said clinical sample, said material comprising a vitamin B_{12} analog which does not bind with intrinsic factor nor interfere with the ability of intrinsic factor to bind with vitamin B_{12}, said analog being selected from the group cobinamide, CN—Cbl—(Cbde—OH), and (3,5,6 Me_3 BZA) (CN, OH) Cba; and

(B) at least two components which are capable of destroying and/or inhibiting endogenous binding protein and intrinsic factor antibodies; said material and said components being present in a combined amount sufficient to release all bound vitamin B_{12} from endogenous binding protein, and said endogenous binding protein component and intrinsic factor antibody blocking component are present in a combined amount sufficient to destroy and/or inhibit substantially all endogenous binding protein and intrinsic factor blocking antibodies present in the clinical sample.

18. A method of preparing a human blood serum sample for vitamin B_{12} competitive binding assay which comprises: treating the sample with a vitamin B_{12} analogue, dithiothreitol at a

concentration in the range of about 0.04 N to about 0.10 N and sodium hydroxide at a concentration in the range of about 0.3 N to about 1.0 N; and incubating said mixture under ambient conditions.

4,451,572

PRODUCTION OF SURFACE MODIFIED ZEOLITES FOR SHAPE SELECTIVE CATALYSIS

Ian A. Cody, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 331,262, Dec. 16, 1981, Pat. No. 4,390,414. This application Mar. 21, 1983, Ser. No. 477,434

Int. Cl.³ B01J *29/12, 31/02*

U.S. Cl. 502—62 **19 Claims**

1. A method for surface modifying a large pore zeolite so as to produce a material retaining sufficient catalytically active sites to be suitable for use as a catalyst, which method comprises chemically modifying said large pore zeolite by reacting said zeolite under anhydrous conditions with an organosilane wherein the starting zeolite to be modified possesses sites some of which are available for reaction with the organosilane and wherein some of the sites have been protected to prevent reaction with the organosilane and wherein the organosilane is capable of entering into the channels of the zeolite and reacting with the available reactive sites present therein as well as reacting with reactive sites present on the external surface of said zeolite.

2. The method of claim 1 wherein the protected sites which are prevented from reacting with the organosilane have been produced by the procedure of first calcining and cooling a cation exchanged zeolite either or both of such steps of calcination and cooling being conducted in the presence of a moist atmosphere followed by calcining and cooling under anhydrous conditions to yield a mixed population of protected, available and catalytically active sites on the zeolite prior to reacting said zeolite under anhydrous conditions with the organosilane.

4,451,573

CATALYST FOR POLYMERIZATION OF OLEFINS

Tadashi Ikegami; Katsuhiko Takaya, and Haruyuki Yoneda, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1982, Ser. No. 385,221

Claims priority, application Japan, Jun. 2, 1981, 56-83828; Jun. 3, 1981, 56-84308; Jul. 1, 1981, 56-101308

Int. Cl.³ C08F *4/64, 4/68, 4/62*

U.S. Cl. 502—113 **22 Claims**

1. A catalyst for polymerizing olefins comprising:

(A) a solid catalyst component obtained by calcining a product produced by reacting (a) at least one compound selected from an amine compound, a phosphoric acid amide, a hydrocarbyloxy compound of titanium, vanadium, hafnium or zirconium, and a germanium compound having the general formula:

$$R^1R^2R^3R^4Ge$$

wherein (i) R^1, R^2 and R^3 are each independently a hydrocarbon group having 1 through 10 carbon atoms, and R^4 is a hydrogen atom, a halogen atom, a —OH group, or a —O-$GeR^1R^2R^3$ group or (ii) R^1, R^2, R^3 and R^4 are each independently —OR^5 wherein R^5 is a hydrocarbon group having 1 through 10 carbon atoms, or a halogen atom, and a tin compound having the general formula:

$$R^1R^2R^3R^6Sn$$

wherein R^1, R^2 and R^3 are the same as defined above and R^6 is a halogen atom, or a —OH group, with (b) at least one chromium compound (I) in the absence of a carrier and then supporting the reaction product on an inorganic oxide carrier, or (II) effecting the reaction in the presence of an inorganic oxide whereby the product forms on the carrier; and,

(B) an organometallic compound component selected from the following groups (1) through (5):

(1) a hydrocarbon-soluble organomagnesium component having the general formula:

$$M_\alpha Mg_\beta R^7_p R^8_q X_r Y_s$$

wherein M is an element selected from aluminum, boron, beryllium, zinc and lithium; R^7 and R^8 are the same or different hydrocarbon groups having 1 to 20 carbon atoms; X and Y are the same or different groups selected from OR^9, $OSiR^{10}R^{11}R^{12}$, $NR^{13}R^{14}$, or SR^{15} wherein R^9, R^{10}, R^{11}, R^{12}, R^{13}, and R^{14} are each independently a hydrogen atom, or a hydrocarbon group having 1 to 20 carbon atoms, and R^{15} is a hydrocarbon group having 1 to 20 carbon atoms; α is zero or greater than zero, β is greater than zero and p, q, r, and s are each zero or greater than zero and both p and q are not zero at the same time and have the relationship $p+q+r+s=m\alpha+2\beta$ wherein m has a valency of M;

(2) an organoaluminum component obtained by reacting (i) one mole of a trialkylaluminum compound with (ii) 0.1 to 2 moles of a carbinol having 1 to 10 carbon atoms, 0.1 to 5 moles of a silanol or siloxane, or a mixture thereof;

(3) a component comprising said hydrocarbon-soluble organomagnesium component (1) and said organoaluminum component (2);

(4) a component comprising said hydrocarbon-soluble organomagnesium component (1) and an organoboron, organozinc, or organolithium compound; and

(5) a component comprising said organo-aluminum component (2) and an organoboron, organozinc, or organolithium compound.

4,451,574

POLYMERIZATION CATALYST

Burnett H. Johnson, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 307,134, Sep. 30, 1981, abandoned. This application Jan. 31, 1983, Ser. No. 461,602

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—115 **22 Claims**

1. A catalyst component for the polymerization of alpha-olefins comprising the solid reaction product obtained by contacting in an inert solvent an inert solid porous particulate support material, (A) at least one organometallic compound of a Group IIA, IIB and IIIA metal, (B) at least one transition metal compound of a Group IVB, VB, VIB, VIIB and VIII metal, and at any stage of the contacting, (C) a sufficient amount of a halogen or interhalogen compound such that after said solid oxide is contacted with said organometallic compound and said transition metal compound halogen or interhalogen compound is available.

2. The catalyst component of claim 1 wherein the inert solid particulate porous support material is a solid oxide support of a Group IIA, IIIA, IVA and IVB metal or a finely divided polyolefin and is contacted in separate stages with (A) the organometallic compound represented by the formula:

$$Me^{II}_x Me^{III}_y R_z X_{2x+3y-z}$$

wherein Me^{II} is Group IIA or IIB metal or mixture thereof and Me^{III} is a Group IIIA metal or mixtures thereof, R is a hydrocarbyl group having from 1 to about 20 carbon atoms, X is a halogen or alkoxide or mixtures thereof, the ratio of $y/x+y$ is from 0 to 1, z has a value within the range of 1 to $2x+3y$, (B) the transition metal compound or mixtures thereof represented by the formula $TrX'_{4-q}(OR')_q$, $TrX'_{4-q}R''_q$, VOX'_3 or $VO(OR')_3$ wherein Tr is a transition metal, R' is a hydrocarbyl group having from 1 to 20 carbon atoms, R'' is an aryl group

or aralkyl group, having from 1 to 20 carbon atoms and 1,3-cyclopentadienyls, X' is halogen and q is 0 or a number equal to or less than 4, and (C) the halogen or interhalogen is chlorine or bromine.

4,451,575

ACTIVATORS FOR ZIEGLER TYPE POLYMERIZATION CATALYSTS USING BIS(TRICHLOROMETHYL) SULFONE

Walter Nudenberg, Newtown; Yong S. Rim, Woodbridge, and Demetreos N. Matthews, Bethany, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,684

Int. Cl.³ C08F *4/68*

U.S. Cl. 502—122 **6 Claims**

1. A catalyst composition comprising an activator in combination with a primary catalyst system, wherein said primary catalyst system is a hydrocarbon soluble catalyst formed by the interaction of an alkyl aluminum halide and vanadium oxychloride, vanadium tetrachloride, an alkyl vanadate, or an alkyl chlorovanadate, and said activator is bis(trichloromethyl) sulfone.

4,451,576

MOLECULAR WEIGHT DISTRIBUTION AND MICROSTRUCTURE MODIFIERS FOR ELASTOMERS

Delmar F. Lohr, Akron, Ohio, and Donald N. Schulz, Annandale, N.J., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

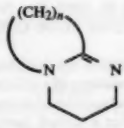
Continuation of Ser. No. 262,664, May 11, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 505,161

Int. Cl.³ C08F *4/48*

U.S. Cl. 502—155 **5 Claims**

1. An elastomeric molecular weight distribution modifier, comprising:

a modifier compound having the formula



where n is from 3 to 6;

said compound utilized in the polymerization of elastomer-forming monomers and,

an organo-lithium compound, said modifier modifying said organo-lithium compound to produce a broad molecular weight distribution in an elastomer of from about 1.7 to about 30.

4,451,577

CATALYST COMPOSITION AND METHOD FOR CURING FURAN-BASED FOUNDRY BINDERS

William W. Coss, Richmond, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed May 6, 1981, Ser. No. 261,319

Int. Cl.³ B01J *31/30, 31/26, 31/02*; B22C *1/22*

U.S. Cl. 502—167 **4 Claims**

1. A catalyst composition comprising:

a. at least one salt of a strong acid in solution and,

b. at least one water dispersible polyvinyl alcohol having a viscosity between 1 and 6 centipoise inclusive at 4 percent solids at 20° C. and having a molecular weight average between about 2,000 and 10,000.

2. The catalyst composition of claim 1 wherein the salt is selected from the group consisting of:

aluminum methane sulfonate, aluminum toluene sulfonate, aluminum xylene sulfonate, aluminum phenol sulfonate, copper toluene sulfonate, copper xylene sulfonate, copper phenol sulfonate, copper methane sulfonate, urea-phenol sulfonate, urea-toluene sulfonate, urea-methane sulfonate, urea-xylene sulfonate, iron phenol sulfonate, iron toluene sulfonate, iron xylene sulfonate, iron methane sulfonate, ammonium chloride, ammonium sulfate, ammonium nitrate, aluminum chloride, aluminum nitrate, aluminum sulfate, copper chloride, copper nitrate and copper sulfate.

3. A storage stable catalyst composition comprising:

a. 35 to 45 percent, inclusive, of at least one salt of a strong acid,

b. 45 to 60 percent, inclusive, water; and

c. 5 to 10 percent of at least one water dispersible polyvinyl alcohol having a viscosity between 1 and 6 centipoise, inclusive, at 4 percent solids at 20° C. and having a molecular weight average between about 2,000 and 10,000.

wherein all percents are based on the weight of the catalyst composition.

4,451,578

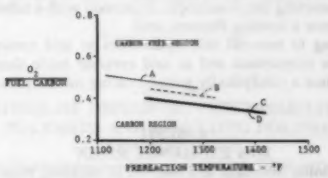
IRON OXIDE CATALYST FOR STEAM REFORMING

Herbert J. Setzer, Ellington; John A. S. Bett, Hamden, and Roger R. Lesieur, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1982, Ser. No. 372,252

Int. Cl.³ B01J *21/04, 23/10, 23/74*

U.S. Cl. 502—303 **1 Claim**



1. A high activity steam reforming catalyst specifically adapted for use in autothermal and tubular steam reforming systems which substantially eliminates carbon plugging in such reforming systems and allows autothermal reformers to operate at reduced oxygen to carbon ratios with heavier distillate hydrocarbons such as No. 2 fuel oil comprising iron oxide deposited on lanthanum stabilized alumina substrate material in an amount of about 20% to about 30% by weight.

4,451,579

MIXED METAL OXIDE CATALYST FOR PRODUCING LOW MOLECULAR WEIGHT HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

Michael F. Lemanski, Cleveland, and Wayne R. Kliewer, North Randall, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 8, 1982, Ser. No. 440,120

Int. Cl.³ B01J *23/02, 23/12, 23/24, 23/72*

U.S. Cl. 502—306 **8 Claims**

1. A mixed metal oxide catalyst prepared by the process comprising:

(a) adding at least one compound selected from copper chromate, copper molybdate and copper tungstate to a solution containing a decomposable salt selected from the salts of thorium and uranium;

(b) heating such solution to an elevated temperature;

(c) adding a decomposable salt selected from the alkali or alkaline earth metals to said solution;

(d) adjusting the pH of said solution to at least 7.5;

(e) neutralizing said solution;

(f) recovering the precipitate; and

(g) calcining said precipitate.

4,451,580

METHOD OF PREPARING A SUPPORTED CATALYST

Graham Butler, Wantage, and Christopher J. Wright, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 27, 1982, Ser. No. 424,236

Claims priority, application United Kingdom, Oct. 1, 1981, 8129669

Int. Cl.³ B01J *21/04, 23/46, 23/77*

U.S. Cl. 502—335 11 Claims

1. A method of preparing a supported catalyst comprising the steps of:

(i) providing an aqueous hydrolysis solution containing, as a first constituent, one or more compounds each being hydrolysable to a hydroxide convertible to a catalytically active component under the conditions of step (v) below, and containing, as a second constituent, one or more compounds each being hydrolysable to a hydroxide convertible to a ceramic oxide under the conditions of step (v) below;

(ii) providing said aqueous hydrolysis solution in an aqueous hydrolysis agent solution comprising a co-hydrolysis agent to effect hydrolysis of said first and second hydrolysable constituents under conditions such that an aqueous dispersion comprising an intimate mixture of said hydroxides is produced;

(iii) converting the aqueous dispersion to a thixotropic dispersion by a process including aging the aqueous dispersion by subjecting it to a heat treatment to give a gel;

(iv) contacting the thixotropic dispersion with a substrate to produce a coating thereon; and

(v) firing to convert said hydroxides to said catalytically active component and to said ceramic oxide thereby to produce a catalytically active coating on the substrate.

4,451,581

ION EXCHANGE RESIN

Brian A. Bolto, Mitcham, and Mervyn B. Jackson, West Brunswick, both of Australia, assignors to ICI Australia Ltd., Victoria and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

PCT No. PCT/AU82/00037, 371 Date Sep. 27, 1982, 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/03398, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 22, 1982, Ser. No. 432,919

Claims priority, application Australia, Mar. 27, 1981, PE8173

Int. Cl.³ B01J *39/18, 43/00*

U.S. Cl. 521—28 16 Claims

1. A thermally regenerable amphoteric ion-exchange resin comprising an acidic ion-exchange polymeric component and a basic ion-exchange polymeric component, characterized in that the basic polymeric component is a polyetheramine which is prepared from a poly(α-halo-epoxyalkane) or a copolymer thereof, by treatment with an aminating agent selected from the group consisting of methylamine, ethylamine, dimethylamine, diethylamine, methylethylamine, pyrrolidine, piperidine and homopiperidine, and a crosslinking agent which is a diamine or a salt thereof.

4,451,582

PREPARATION OF INSOLUBLE, ONLY SLIGHTLY SWELLABLE POLYMERS OF BASIC VINYL-HETEROCYCLIC COMPOUNDS

Walter Denzinger, Speyer; Hans-Helmut Goertz, Ludwigshafen; Axel Sanner, Frankenthal, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,242

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209224

Int. Cl.³ C08F *126/06, 226/06, 8/10;* B01J *39/20*

U.S. Cl. 521—38 18 Claims

1. A process for the preparation of insoluble, only slightly water-swellable, granular polymers of a basic vinyl-heterocyclic compound having a pKa of greater than 4, and of their copolymers with up to 30% by weight of copolymerizable monomers selected from the group consisting of styrene, acrylic esters, vinyl esters, acrylomide and N-vinyl-lactams, by polymerizing the monomers, wherein the following measures are employed simultaneously:

(a) 0.1–10% by weight, based on the total amount of monomer, of a crosslinking agent which crosslinks through its double bonds is employed,

(b) oxygen organic solvent is excluded and

(c) polymerization by irradiation or initiators are excluded.

4,451,583

RECYCLING OF FLEXIBLE POLYURETHANE FOAM SCRAP

Edwin T. Chesler, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 26, 1982, Ser. No. 342,859

Int. Cl.³ C08G *18/02;* C08J *9/16, 9/36*

U.S. Cl. 521—49.5 23 Claims

1. In a process for preparing a flexible polyurethane foam from a foam forming reaction mixture comprising a polyol, an organic polyisocyanate, a foaming agent and a reaction catalyst, the improvement comprising blending in said reaction mixture a proportion of comminuted, flexible polyurethane foam scrap having a maximum particle size of less than about 600 microns to form a suspension in said reaction mixture, said proportion of scrap being from about 3 to about 40 parts, by weight, based on 100 parts of total polyol weight.

4,451,584

MOLDING COMPOUND FOR MOLDING BODY PORTIONS AND PROCESS FOR PRODUCING THIS MOLDING COMPOUND

Philipp Schaefer, Oberstrasse 16, D-3000 Hannover 1, Fed. Rep. of Germany

Filed May 21, 1982, Ser. No. 381,000

Int. Cl.³ B68G *1/00, 11/04;* C08L *27/08, 83/04*

U.S. Cl. 521—54 7 Claims

1. A molding compound for molding body portions, said molding compound consisting of a silicone being initially liquid or pasty and, respectively, kneadable and solidifying to a rubber-like consistency after a certain time interval when having added a hardener, the silicone being added, prior to solidifying, with pressure-elastic hollow microspheres of a diameter between 0.01 and 0.1 mm, the thin shells of which consist of a vinylidene chloride copolymer and the interior of which contains a gas, the microspheres being present in the compound in an amount between 10 and 85 percent by volume.

4,451,585

RESIN-IMPREGNATED FIBRE COMPOSITE MATERIALS AND A PROCESS FOR THEIR MANUFACTURE

Bengt Andersson, Söråker, Sweden, assignor to KemaNord AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 345,624, Feb. 4, 1982, abandoned. This application Jun. 9, 1982, Ser. No. 386,614

Claims priority, application Swedea, Feb. 5, 1981, 8100819

Int. Cl.³ C08J *9/32*

U.S. Cl. 521—59 10 Claims

1. A method for producing a fibre composite material containing fibres, expanded thermoplastic microspheres and a resin of curable type, comprising the steps of

(a) dispersing in a room separate and free fibres,

(b) applying to the dispersed and free fibres

(1) a curable resin and

(2) unexpanded thermoplastic microspheres containing a volatile, liquid blowing agent,

(c) heating the unexpanded thermoplastic microspheres until they expand and

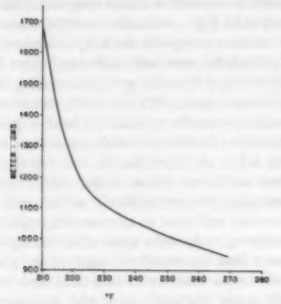
(d) collecting an agglomerate of fibres, expanded microspheres and resin.

4,451,586

PROCESS AND APPARATUS FOR MANUFACTURING FLAME RETARDANT FLEXIBLE FOAMED ARTICLES

Alonzo H. Searl, Fort Worth; Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jun. 30, 1982, Ser. No. 393,973
Int. Cl.³ C08J *9/00, 9/02*
U.S. Cl. 521—88 **6 Claims**



1. A foamed fire-retardant polymer article having improved impermeability and flexibility, said article comprising:

a polymer exhibiting high impermeability;

an elastomer blended with said polymer and having a solubility parameter close to that of said polymer;

a fire-retardant blended with said polymer and elastomer; and,

said polymer/elastomer/fire-retardant blend having a closed-cell structure.

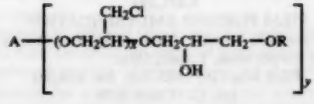
4,451,587

POLYURETHANE FOAM AND ITS PRODUCTION

Akizo Keshi, Takatsuki, and Katsuhisa Kodama, Nishinomiya, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 23, 1982, Ser. No. 422,435
Claims priority, application Japan, Oct. 22, 1981, 56-169519
Int. Cl.³ C08G *18/14, 18/50*
U.S. Cl. 521—171 **14 Claims**

1. A polyurethane foam produced by the reaction of a polyisocyanate and a polyether polyol in the presence of a catalyst, a cell regulating agent and a blowing agent comprising water, the polyether polyol of which consists of a halogenated polyether polyol (I) of the general formula:



wherein x is a number of 0 to 7; y is a number of 2 to 3; A is a saturated or unsaturated, brominated polyol residue having a number of functional groups of y; and R is hydrogen or an alkyl group having 1 to 5 carbon atoms and (II) polyether polyol having a number of functional groups of 2 to 8, a weight ratio of the added amounts of propylene oxide and ethylene oxide within the range of 75 to 95/25 to 5 and a hydroxyl number of about 20 to 100 mgKOH/g, whereby the weight ratio of (I) to (II) is 95 to 25/5 to 75 and the amount of water is 5 to 20 parts by weight against 100 parts by weight of the polyol component.

4,451,588

HIGH LOAD BEARING POLYURETHANE FOAMS MADE FROM MIXED INITIATOR POLYETHER POLYOLS

George P. Speranza; Michael Cuscurida, and Bruce W. Peterson, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,198
Int. Cl.³ C08G *18/14, 18/48*
U.S. Cl. 521—175 **12 Claims**

1. A method for producing a flexible polyurethane foam having improved load bearing properties comprising reacting an organic polyisocyanate with a mixed initiator polyether polyol in the presence of a catalytic amount of a polyurethane formation catalyst and a blowing agent, where the polyol is made by reacting

a. one or more alkylene oxides with

b. a mixture of initiators consisting essentially of

(1) 60 to 90 wt.% of a trifunctional partially alkoxylated initiator, and

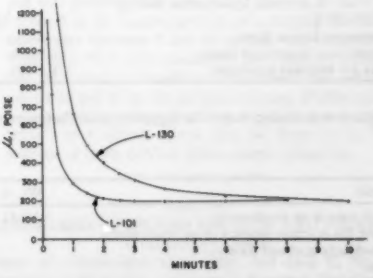
(2) 10 to 40 wt.% of a secondary partially alkoxylated initiator having an active hydrogen functionality of from 4 to 8.

4,451,589

METHOD OF IMPROVING PROCESSABILITY OF POLYMERS AND RESULTING POLYMER COMPOSITIONS

Michael T. Morman, Appleton, and Tony J. Wisneski, Kimberly, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 273,938, Jun. 15, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 472,524
Int. Cl.³ C08L *91/06*
U.S. Cl. 523—124 **19 Claims**



1. Method of producing polymer pellets having improved extrusion characteristics comprising the steps of:

(a) providing a high weight average molecular weight polymer selected from the group consisting of polymers and copolymers of propylene and butylene,

(b) adding to said polymer a free radical generating prodegradant having a half-life in said polymer of at least about one-half minute at pelletizing extrusion temperatures, and

(c) pelletizing said polymer under conditions wherein greater than about 50% of that added and at least about 0.01% by weight of said prodegradant remains available for further degradation after pelletizing.

4,451,590

ORGANIC FRICTION MATERIAL

Hiroto Fujimaki, Kokubunji; Shigetoshi Ajima, and Kazuhiro Watanabe, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 382,729, May 27, 1982, Pat. No. 4,386,168. This application Mar. 21, 1983, Ser. No. 477,486
Claims priority, application Japan, Jun. 10, 1981, 56-89032
The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.
Int. Cl.³ C08K *3/08, 3/04*
U.S. Cl. 523—155 **5 Claims**

1. An organic friction material comprising 5 to 25% by volume of metal fiber, 3 to 40% by volume of activated carbon, 3 to 15% by volume of carbon fiber, 7 to 47% by volume of an organic and inorganic filling material and 10 to 30% by volume of phenolic resin.

4,451,591

TWO-COMPONENT HIGH SOLIDS COATING FOR RUSTY STEELS

Henry A. Kozak, Edison, and Tony Y. Liu, East Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,836
Int. Cl.³ C08L *63/02*
U.S. Cl. 523—177 **3 Claims**

1. A two-component composition consisting essentially of a Component A and a Component B, said components intended for mixing in a volume ratio of from about 2:1 to 1:2 wherein:

the weight percent ranges and the ingredients in Componant A are:

Ingredients	Wt. %
a diglycidyl ether of Bisphenol A having an epoxy equivalent weight of 185–192	50–80
leafing aluminum paste comprising 68% of said flakes in 92 vol. % aliphatic hydrocarbon boiling at 150–175° C. and 8 vol. % aromatic hydrocarbon boiling at 150–175° C.	25–35
Coumarone-Indene Resin	3–25
Organic wax thixotropic agent	0.1–2.0
Silica gel moisture scavanger	0.1–2.0

the weight percent ranges and the ingredients in Component B are:

Ingredients	Wt. %
Fatty acid resin is an amidoamine comprising the reaction product of an ethylenically unsaturated fatty acid and alkenyl polyamine	30–45
Fatty acid diamine salt is selected from N—tallow-1,3-propane diamine mono-octadecenoate and N—tallow-1,3-propane diamine dioctadecenoate	3–6
Coumarone-Indene Resin, softening point of about 50° F.	3–25
Organic wax thixotropic agent	0.1–2
Microcystalline silica and magnesium silicate filler	33–56
Pigment selected from zinc phosphate and zinc chromate	1–6
Supplemental curing agent selected from dimethylamino-phenol and 2,4,6-tris(dimethylaminomethyl)phenol	0.5–3.

4,451,592

RESIN MODIFICATION FOR GLASS FIBER ADHERENCE

Denny E. Black; David W. Garrett, both of Newark, and Thomas A. Coakley, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 6, 1983, Ser. No. 455,788
Int. Cl.³ C08K *5/09*
U.S. Cl. 523—206 **10 Claims**

1. A method of improving the adherence between an uncured polyolefin resin and a sized glass fiber incorporated into said uncured resin as reinforcement and having on its surface a coating comprising the residue obtained by removing water from an aqueous composition comprising an oxidized polyolefin, a carboxylated high molecular weight elastomer and a silane which method comprises forming a mixture comprising an uncured polyolefin resin and said sized glass fiber and at least one acid selected from the group consisting of substitued benzoic acids, benzenedicarboxylic acids, benzenetricarboxylic acids, benzenetetracarboxylic acids, benzenepentacarboxylic acids, benzenehexacarboxylic acids, cyclohexanedicarboxylic acids, fatty acids, aliphatic diacids, benzenediacrylic acids, benzenediacetic acids, naphthoic acids, naphthalenedicarboxylic acids and naphthalenedisulfonic acids, said acid being added in an amount sufficient to increase the tensile strength of the glass-containing polyolefin resin after curing to a tensile strength greater than the tensile strength of the glass-containing cured resin in the absence of said acid, and molding said mixture to cure said uncured resin, and to incorporate said glass in said cured resin in reinforcing relationship.

4,451,593

PROCESS FOR FINISHING RESIN USING REDUCED ENERGY INPUT

Antonios Nicholakopoulos, Mercerville; Grace M. Gill, S. Somerville, and Robert P. Nadin, Wharton, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 249,651, Mar. 31, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 401,717
Int. Cl.³ C08J *3/12*
U.S. Cl. 523—322 **8 Claims**

1. An improved process for finishing particulate resin by continuously feeding said resin into a finisher and mechanically working said resin in said finisher to provide finished resin having an elevated temperature, thereafter discharging said finished resin from said finisher, the improvement comprising operating said finisher at a volume utilization of between about 40 and about 95 volume percent at a tip velocity of between 500 and about 800 inches per second and a superficial mixing intensity of 0.7 to 1.1 kilowatts per liter.

4,451,594

FILM FORMER EMULSIFICATION

Leslie E. Campbell, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 10, 1983, Ser. No. 474,081
Int. Cl.³ C08K *5/06*
U.S. Cl. 523—336 **6 Claims**

1. A method of producing an aqueous emulsion of an unsaturated diallylphthalate-based resin which comprises:

a. mixing said resin with an emulsifying agent comprising a poly(oxypropylene) poly(oxyethylene) to form a first composite;

b. adding water to said first composite to form a second composite;

c. agitating said second composite to form an emulsion in which the aqueous phase is the continuous phase.

4,451,595

HETEROGENEOUS RUBBER COMPOSITIONS MADE FROM CHEMICALLY SIMILAR BLENDS

Bling-Lin Lee, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 24, 1983, Ser. No. 460,689
Int. Cl.³ C08K 3/04
U.S. Cl. 523—351 20 Claims

1. A process for making a crack growth resistant rubber composition, comprising the steps of:

(a) forming a heterogeneous rubber composition comprising by weight approximately 100 total parts of a rubber, and from about 60 to about 95 total parts of a carbon black, said rubber composition formed by

(b) separately forming a minor fraction comprising one or more rubber compounds, and carbon black, said rubber compound selected from the group consisting of nitrile rubber, a polymer made from a conjugated diene having from 4 to 12 carbon atoms, and a copolymer made from monomers selected from the group consisting of conjugated dienes having from 4 to 12 carbon atoms and vinyl substituted aromatics having from 8 to 12 carbon atoms, said minor fraction containing from about 10 to about 50 parts by weight of said rubber, and an amount of carbon black ranging from about 2.5 parts by weight to about 37.5 parts by weight;

(c) separately forming a major fraction comprising an identical one or more rubber compounds and a similar carbon black as in said minor fraction, said major fraction having a range of said rubber ranging from about 50 to about 90 parts by weight and an amount of said carbon black ranging from about 22.5 to about 92.5 parts by weight;

(d) separately mixing and heating at least one of said fractions; and

(e) mixing together under heat said major fraction and said minor fraction to produce said heterogeneous rubber composition.

4,451,596

WATER-DILUTABLE LACQUER BINDERS BASED UPON ALKYD AND ACRYLATE RESINS

Hans-Christoph Wilk, Neuss, and Bernd Wegemund, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 330,275, Dec. 14, 1981, abandoned. This application Sep. 7, 1982, Ser. No. 415,067
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1981, 3132937
Int. Cl.³ C08L 67/06
U.S. Cl. 523—501 23 Claims

1. A method for the preparation of water-dilutable resin preparations based upon alkyd and acrylate resins which comprises the steps of:

(a) preparing an aqueous alkyd resin dispersion wherein the alkyd resin has an acid number of from about 5 to 40 and a hydroxyl number of from about 150 to 300 and the dispersion has a solids content of from about 30 to 90 percent by weight by reacting an alkyd resin having an acid number of from about 30 to 100 with glycidol, glycerol, or a mixture thereof until the acid number is from about 5 to 40; and

(b) polymerizing monomers of acrylic acid derivatives and/or methacrylic acid derivatives in the dispersion from step (a) to obtain a total solids content of from about 30 to 80 percent by weight, the weight ratio of alkyd resin to acrylate resin being from about 1:4 to 9:1.

4,451,597

HIGH SOLIDS COLOR COAT CONTAINING ALCOHOL SOLUBLE CELLULOSE ACETATE BUTYRATE

Claus Victorius, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 15, 1982, Ser. No. 441,745
Int. Cl.³ C08L 1/14; C08B 21/08; B32B 5/16, 27/08
U.S. Cl. 524—39 19 Claims

1. An acrylic color coat enamel coating composition comprising about 25–50% by weight of a binder of film-forming constituents and correspondingly about 50–75% by weight of a volatile organic solvent carrier at spray viscosity and containing in addition about 2–150% by weight, based on the weight of the binder, of pigment; wherein the binder of film-forming constituents consists essentially of about 20–70% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of 50–90% by weight of an alkyl methacrylate or an alkyl acrylate each having 1–12 carbon atoms in the alkyl groups or a mixture thereof and 10–50% by weight of a hydroxyalkyl acrylate or a hydroxyalkyl methacrylate each having 2–4 carbon atoms in the hydroxyalkyl groups or a mixture thereof and in which the acrylic polymer has a weight average molecular weight of about 2500–25,000 and a glass transition temperature of about −20° C. to +25° C.; about 0–40% by weight, based on the weight of the binder, of a hydroxy-terminated polyester urethane resin; about 25–40% by weight, based on the weight of the binder, of an alkylated melamine formaldehyde crosslinking agent; and about 4–20% by weight, based on the weight of the binder, of a rheology control agent consisting essentially of an alcohol soluble cellulose acetate butyrate having a butyryl content of about 45–50% by weight, a hydroxy content of about 4–5% by weight and a viscosity of about 0.2–0.4 second.

4,451,598

COMPOSITIONS FOR SEALING PRODUCTS

Jean C. Decroix, Arras, France, assignor to Societe Chimique des Charbonnages S.A., Paris la Defense, France

Filed Jun. 2, 1983, Ser. No. 503,401
Claims priority, application France, Jun. 3, 1982, 82 9631
Int. Cl.³ C08L 31/00
U.S. Cl. 524—69 8 Claims

1. A composition for sealing products comprising:

(a) from 35 to 95 weight percent of at least one distillation product selected from the group consisting of bitumens and soft pitches; and

(b) from 5 to 65 weight percent of a terpolymer having a melt index between 1 and 10 dg/min and comprising: (i) from 88 to 98.7 mole percent of units derived from ethylene, (ii) from 1 to 10 mole percent of units derived from an ester selected from the group consisting of alkyl acrylates and methacrylates, wherein said alkyl group contains from 1 to 6 carbon atoms, and (iii) from 0.3 to 3 mole percent of units derived from maleic anhydride.

4,451,599

PLASTICIZED EVOH AND PROCESS AND PRODUCTS UTILIZING SAME

Thomas W. Odorzynski, Green Bay, and Jack E. Knott, II, Appleton, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 249,975, Apr. 1, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,420
Int. Cl.³ C08K 5/43
U.S. Cl. 524—169 3 Claims

1. An ethylene vinyl alcohol copolymer resin blend that is extrudable to produce a film of uniform caliber and excellent oxygen barrier properties, consisting essentially of about 95 to 80 weight percent of ethylene vinyl alcohol copolymer having a molecular weight of about 15,000 to 30,000 and a melting point temperature of about 325 degrees to 375 degrees Fahrenheit, and conversely about 5 to 20 weight percent of a plasticiz-

ing agent selected from the group consisting of aromatic sulfonamide plasticizers and is selected from the class consisting of o-p-toluene sulfonamide, N-ethyl-o, p-toluene-sulfonamide and ethylbenzene sulfonamide polyethyl oxazoline, polyvinyl pyrrolidone, polyvinyl formaldehyde, and polyamides having melting point temperatures below about 400 degrees Fahrenheit, said plasticizers being compatible with said copolymer and capable of intermolecular hydrogen bonding therewith.

4,451,600

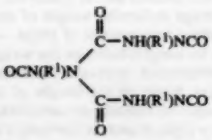
ADDITIVE FOR COATING COMPOSITIONS

Grant C. Fry, Lake Orion, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1982, Ser. No. 451,249
Int. Cl.³ C08K *5/39, 5/98, 5/29, 5/12*
U.S. Cl. 524—196 **12 Claims**

1. An additive for coating compositions which comprises about:

(A) 20–50% by weight of a polyisocyanate having the formula



where R^1 is $(CH_2)_6$,

(B) 1–15% by weight of polyethylene glycol diethyl hexoate,

(C) 1–10% by weight of a blend of ultraviolet light stabilizers comprising a benzotriazole ultraviolet light stabilizer and a hindered amine light stabilizer, and

(D) 25–78% by weight of organic solvent.

4,451,601

GLASS-FILLED POLYARYLENE SULFIDE COMPOSITIONS CONTAINING ORGANOSILANES

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 300,859, Sep. 10, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,079
Int. Cl.³ C08K *5/54*
U.S. Cl. 524—263 **19 Claims**

1. A composition comprising: glass-filled polyarylene sulfide and at least one organosilane in an amount sufficient to decrease the flow rate of said polyarylene sulfide upon heating of the composition to a temperature at least about the melting point of said polyarylene sulfide; wherein said at least one organosilane is selected from the group consisting of
1-Benzylchloro-2-trimethoxysilylethane,
2-p-Sulfoxylazylethyltrimethoxysilane, and
(p-Aminophenyl)trimethoxysilane.

4,451,602

ONE COMPONENT ROOM TEMPERATURE SETTING COMPOSITION

Hisao Furukawa, and Yasushi Kato, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1982, Ser. No. 402,221
Claims priority, application Japan, Jul. 27, 1981, 56-118354
Int. Cl.³ C08K *5/54;* **C08L** *43/00, 83/00*
U.S. Cl. 524—266 **5 Claims**

1. A one component room temperature setting composition which comprises:

(A) a vinyl polymer having on the polymer chain end or the side chain thereof at least one silyl group having a hydrolyzable group per one polymer molecule, the main chain of the vinyl polymer consisting essentially of a polymer of a vinyl compound; the silyl group-containing vinyl polymer (A) having a number average molecular weight of 1,000 to 10,000 and containing as a comonomer, 0.1 to 10% by weight of units of a vinyl compound having active hydrogen in the form of a group selected from the group consisting of a carboxyl group, an hydroxyl group, an amino group and an acid amido group,

(B) 0.005 to 10 parts of a hardener,

(C) 0 to 200 parts of a pigment,

(D) 0.1 to 100 parts of at least one member selected from the group consisting of a hydrolyzable silicon compound of the general formula:

$$X_{4-n}{}^1—Si—R_n{}^2$$

wherein R^2 is an organic group bonded to the silicon atom through a carbon atom, X^1 is a hydrolyzable group selected from the group consisting of an alkoxyl group, an alkoxy-alkoxyl group, a phenoxy group, an acyloxyl group, a ketoxymate group, an amino group, an aminoxy group, an acid amide group and an alkenyloxy group, and n is 0 or an integer of 1 to 3, and a partial hydrolysis product of the hydrolyzable silicon compound, and

(E) 0 to 500 parts of a solvent, said parts being parts by weight per 100 parts by weight of the component (A).

4,451,603

ABRASION-RESISTANT COATINGS

Kazys Sekmakas, Palatine, and Ronald L. Richards, Oak Park, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jun. 10, 1982, Ser. No. 387,252
Int. Cl.³ C08L *91/06*
U.S. Cl. 524—279 **9 Claims**

1. A coating composition selected from solvent solution coating compositions and aqueous coating compositions comprising:

(1) a polyol component which is an adduct of at least a stoichiometric proportion of ethylene oxide or propylene oxide with a bisphenol;

(2) a solution copolymer containing from 40% to 70% of isobutyl acrylate with 3% to 20% of hydroxy alkyl ester of a monoethylenic carboxylic acid, up to about 20% of monoethylenic carboxylic acid, and any balance consisting essentially of monomer containing a single ethylenic group and no other reactive group; and

(3) aminoplast resin, said polyol constituting from 20% to 40% of said components (1), (2) and (3), said copolymer being present in an amount of from 85% to 150% of the polyol, and the balance of said components (1), (2) and (3) being said aminoplast resin, and carnauba wax in an amount of from 1 to 10 pounds of wax solids per 100 gallons of coating composition.

4,451,604

STABILIZED POLYOLEFIN COMPOSITIONS

Kenneth R. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 264,530, May 18, 1981, abandoned. This application Oct. 8, 1982, Ser. No. 433,751
Int. Cl.³ C08K *5/10;* **C08L** *5/13, 23/04, 23/10*
U.S. Cl. 524—312 **11 Claims**

1. Composition of matter comprising a mixture of

(a) 100 parts by weight of an ethylene polymer having 0 to 10 molecular percent of a comonomer selected from the group of olefins of 3 to 8 carbon atoms, said polymer containing Ti as catalyst residue,

(b) 0.002 to 0.2 parts by weight of a phenolic stabilizer,

(c) 0.001 to less than 0.05 parts by weight of one or more glycerides of fatty acids, said glycerides reducing the discoloration effects occurring within the composition, said composition being free of organic phosphite.

4,451,605

SOLVENT-BASED, ONE-PART, FILLED POLYURETHANE FOR FLEXIBLE PARTS

John J. Theodore, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 7, 1982, Ser. No. 375,954
Int. Cl.³ C08K 3/34, 3/26, 3/08, 3/22
U.S. Cl. 524—423 5 Claims

1. A one-part composition curable upon solvent evaporation having particular utility in providing a putty for use in filling recessed areas in flexible parts of damaged auto bodies and the like, said composition having a viscosity in the range of 50,000 to 450,000 cps and comprising by volume:

(a) 6–25 parts of a binder comprising substantially non-reactive solvent-soluble polyurethane having an elongation at break value of at least 175%;

(b) 43–68 parts solvent for said binder, which solvent will not substantially swell the flexible part being repaired; and

(c) 20–42 parts by volume talc filler having an average particle size less than about 20 microns.

4,451,606

COPOLYMERIC NUCLEATING AGENT FOR POLYESTER

Richard W. Campbell, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 23, 1983, Ser. No. 469,076
Int. Cl.³ C08G 63/70, 63/76
U.S. Cl. 524—445 35 Claims

1. A method for effecting, promoting and hastening the crystallization of thermoplastic polyester compositions which comprises admixing an effective, nucleating amount of a nucleating copolymer of a poly(alkylene terephthalate) and a sulfonate salt of an aromatic dicarboxylic acid or derivative thereof with a thermoplastic polyester.

4,451,607

POLY(ARYLENE SULFIDE) COMPOSITIONS

Rodrigo A. Garcia, Pasadena, Tex., and Robert J. Martinovich, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1983, Ser. No. 461,321
Int. Cl.³ C08K 3/40
U.S. Cl. 524—494 19 Claims

11. A method for increasing the crystallinity of poly(arylene sulfide) comprising melt-blending therewith a crystallinity increasing amount of hydrogenated conjugated diene/monovinyl aromatic block copolymer said amount being in a range of up to about 5 weight percent of the total composition said block copolymer having been produced by sequential polymerization of about 10 to about 90 parts by weight conjugated diene with about 90 to about 10 parts by weight monovinyl substituted aromatic hydrocarbon and subsequent hydrogenation of at least 80 percent of the aliphatic double bonds while not more than 25 percent of the aromatic double bonds have been hydrogenated.

13. A method of claim 11 wherein said composition contains up to about 65 percent by weight of filler.

14. A method of claim 13 wherein said filler is fiberglass.

4,451,608

AMPHOTERIC ACRYLIC ESTER BASED LATEXES

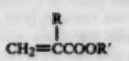
Kenneth Drake, and Richard A. Hammock, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1982, Ser. No. 393,546
Int. Cl.³ C08L 33/06
U.S. Cl. 524—560 10 Claims

1. An aqueous amphoteric latex formed by reacting a base polymer latex containing

(I) up to about 55 weight percent solids comprised of:

(a) from about 65 to about 90 weight percent of acrylic esters and/or methacrylic esters of the formula:



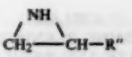
wherein R is hydrogen or methyl and R' is aryl or alkyl of from 1 to 12 carbon atoms;

(b) from about 10 to about 35 weight percent acrylic acid and/or methacrylic acid;

(c) from 0 to about 25 weight percent of pH neutral monomers capable of polymerizing with acrylic esters and/or methacrylic esters; and

(d) from about 0.5 to about 2 weight percent of a chain transfer agent, wherein the weight percents of components (a), (b), (c) and (d) are based upon the total weight of monomers in the base polymer; and

(II) at least about 45 weight percent water; with from about 25 to about 75 mole percent, based on the number of moles of acrylic acid and/or methacrylic acid in the base polymer, of an alkylene imine of the formula:



wherein R" is hydrogen or linear or branched alkyl of from 1 to 5 carbon atoms.

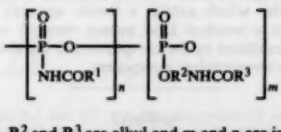
4,451,609

FLAME-RETARDED ACOUSTIC DIAPHRAGM

Fumio Kawahara; Masanori Takahashi, and Katsuyoshi Kumagai, all of Yamagata, Japan, assignors to Pioneer Electronic Corporation, Tokyo and Mogami Denki Kabushiki Kaisha, Yamagata, both of, Japan

Filed Jun. 24, 1982, Ser. No. 391,962
Claims priority, application Japan, Jun. 26, 1981, 56-98417
Int. Cl.³ G10K 13/00; H04R 7/00
U.S. Cl. 524—708 10 Claims

1. A flame-retarded acoustic diaphragm comprising a cone composed of fibrous cellulose, impregnated with an admixture of a low formaldehyde content melamine resin as a binder and an organic phosphorus- and nitrogen-containing compound, as a flame retardent impregnated therein, said organic phosphorus- and nitrogen-containing compound being selected from derivatives of phosphonic acid having the formula as follows:



wherein R^1, R^2 and R^3 are alkyl and m and n are integers, said flame retardent being present in an amount sufficient to retard flames on over heating of said diaphragm and said melamine resin being present in an amount sufficient to firmly bind said flame retardent to said diaphragm.

4,451,610

PREPARATION OF CURABLE SOLID POLYESTER RESIN PELLETS AND POWDERS

Jon E. Collister, Austinburg, Ohio, assignor to Premix, Inc., North Kingsville, Ohio

Continuation of Ser. No. 47,330, Jun. 11, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,814
Int. Cl.³ C08L 67/06; C08K 3/22
U.S. Cl. 525—19 20 Claims

1. A method of preparing curable solid polyester resin pel-

lets and powders which are suitable for use in injection, compression or transfer molding operations comprising

(a) preparing a liquid mixture consisting essentially of an unsaturated polyester resin, at least one monomeric unsaturated polymerizable material containing a terminal ethylene group, and an alkaline earth metal oxide or hydroxide in an amount effective to provide a viscosity for said mixture characterized by a plateau region in the viscoelastic spectrum of said mixture,

(b) allowing the liquid mixture to stand until the alkaline earth metal oxide or hydroxide and the polyester co-react, and a desired increase in viscosity characterized by a plateau region in the viscoelastic spectrum of said mixture has been attained, then

(c) dispersing in the mixture obtained in (b) with high shear mixing, a polymerization initiator and a filler, fibrous reinforcing material, pigment or mold release agent, or mixture thereof, the temperature of said mixture being increased during step (c) to a level suitable for extrusion,

(d) maintaining the temperature of the mixture obtained in step (c) at a level suitable for extrusion and extruding said mixture to form dry, free-flowing pellets or powders.

4,451,611

PROCESS FOR FORMING BLEND OF POLYALKYLENE TEREPHTHALATE AND WHOLLY AROMATIC POLYESTER WHICH EXHIBITS AN ANISOTROPIC MELT PHASE

David E. Ciacotta, South Orange, and Frank M. Berardinelli, Millington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 15, 1981, Ser. No. 330,988
Int. Cl.³ C08L *67/04*
U.S. Cl. 525—51 **22 Claims**

1. A process for producing a polymer blend which exhibits an anisotropic melt phase and is capable of forming shaped articles having satisfactory mechanical properties, said process comprising the steps of:

(a) post-polymerizing a melt processable wholly aromatic polyester which is capable of forming an anisotropic melt phase apart from said blend, said post-polymerizing step being conducted at a temperature and for a period of time sufficient to increase the inherent viscosity of said wholly aromatic polyester by at least approximately 50 percent, and

(b) subsequently intimately mixing together approximately 85 to 95 percent by weight of said wholly aromatic polyester and approximately 5 to 15 percent by weight of a polyalkylene terephthalate,

wherein said resulting polymer blend is capable of forming shaped articles which exhibit a tensile strength, a flexural strength, and a notched Izod impact strength which each exceed that exhibited by the composition in the absence of the polyalkylene terephthalate component.

4,451,612

CONTINUOUS PROCESS FOR THE PREPARATION OF RUBBER MODIFIED POLYMERS

Jerry C. Wang, Lodi, and Michael R. Stepanian, Ridgewood, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

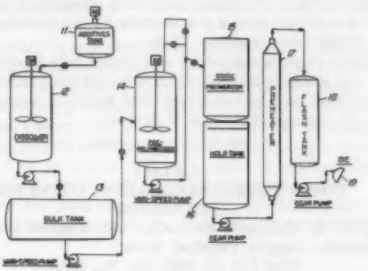
Continuation of Ser. No. 189,424, Sep. 22, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,402
Int. Cl.³ C08F *279/02*
U.S. Cl. 525—53 **8 Claims**

1. A continuous process for the manufacture of high impact polystyrene resin by bulk polymerization which process comprises:

(a) preparing a solution of styrene monomer and rubber;

(b) Prepolymerizing said solution with controlled high shear agitation;

(c) passing said solution to at least one static final stage polymerizer wherein the polymer mass is kept in a state of free flow by gravitational force without agitation and moves downward in essentially plug flow manner, whereby the polymer mass moves uniformly in one direction in the absence of end to end or back mixing, with increasing polymer conversion in the forward direction, wherein said at least one final stage polymerizer consists essentially of at least one shell and tube heat exchanger, said exchanger having a shell in the form of a vertical tower, said shell being installed with multiple heat-exchanger tubes throughout the entire operating volume of said shell, whereby according to said step (c) heat



transfer oil flows on the inside of said heat-exchanger tubes, while said solution being subjected to polymerization occupies the void space outside said heat-exchanger tubes and within the confines of said shell;

(d) passing the product stream from said final stage polymerizer to a preheater;

(e) passing said preheated product stream from said preheater to a devolatilization chamber wherein unreacted monomer and diluent are flashed off; and

(f) finally passing the high impact polystyrene polymer through an extrusion die whereupon solidified high impact polystyrene polymer is produced.

4,451,613

ETHYLENICALLY-UNSATURATED DEXTRIN OLIGOMERS

Alan D. Rousseau, and Laurence W. Reilly, Jr., both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,781
Int. Cl.³ C08L *3/00*
U.S. Cl. 525—54.31 **11 Claims**

1. A photocurable, ethylenically-unsaturated oligomer comprising the reaction product of

(1) 100 parts by weight of a dextrin compound, said dextrin compound being non-gelling at temperatures up to 98° C. when heated in the presence of water, N-methylolacrylamide, and carboxylic acid,

(2) 35 to 70 parts by weight of at least one ethylenically-unsaturated monomer capable of reacting with at least one hydroxyl group of the dextrin compound,

said oligomer having an average in the range of 0.20 to 0.45 ethylenically-unsaturated moiety per every anhydroglucose unit and an equivalent weight of 440 to 990, and at least 75 weight percent of said oligomer is water soluble at 20° C. in a concentration of at least 2.5 percent by weight.

4,451,614

PROCESS FOR THE PRODUCTION OF POURABLE, TACK-FREE VINYL CHLORIDE GRAFT POLYMERS

Karsten Flatau, Haltern, Fed. Rep. of Germany, assignor to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,465

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132694

Int. Cl.³ C08F 00/00

U.S. Cl. 525—80 8 Claims

1. A process for producing a pourable, tack-free vinyl chloride graft polymer of an ethylene-vinyl acetate copolymer and vinyl chloride, having more than 30% by weight of ethylene-vinyl acetate copolymer content, comprising

adding to a suspension of the vinyl chloride graft polymer 0.5–10% by weight, based on the weight of the graft polymer, of polyvinyl chloride prepared by emulsion or microsuspension polymerization in the form of a latex and having a K value of 50–90,

effecting thermal precipitation of the polyvinyl chloride onto the graft polymer by maintaining the mixture of polyvinyl chloride and graft polymer, with stirring for 10–60 minutes, at a temperature of 30°–90° C., and

separating the graft polymer with the polyvinyl chloride precipitated thereon from the mixture.

4,451,615

POLYISOPRENE TOUGHENED ADHESIVE COMPOSITION

Ronald S. Charnock, Castletown, Ireland, assignor to Loctite (Ireland) Limited, Tallaght, Ireland

Continuation of Ser. No. 262,654, Apr. 11, 1981, abandoned. This application Mar. 16, 1983, Ser. No. 473,984

Claims priority, application Ireland, May 9, 1980, 964/80; Jul. 11, 1980, 1449/80

Int. Cl.³ C08F 279/02

U.S. Cl. 525—98 16 Claims

1. In a two-component adhesive composition of the type having a first component comprising a solution of polymer in at least one polymerizable monomer in combination with an adhesion promoter and a free radical catalyst system, and a second component comprising an activator, an improved composition providing increased high temperature resistance in the cured adhesive wherein: said polymer is present at levels of 20% or more of the total composition and is selected from the class of isoprene block copolymer rubbers having a molecular weight in excess of 5,000; and said monomer is an acrylate ester.

4,451,616

PROCESS FOR PREPARATION OF FILTER-CONTAINING POLYTETRAFLUOROETHYLENE FINE POWDER

Shoji Kawachi, Hyogo; Toshinori Kadowaki, and Katsutoshi Yamamoto, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 24, 1980, Ser. No. 171,907

Claims priority, application Japan, Jul. 24, 1979, 54-94460

Int. Cl.³ C08K 5/02; C08J 3/16

U.S. Cl. 525—178 7 Claims

1. A process for the preparation of a filled material containing polytetrafluoroethylene fine powder having good flowability, by coagulating polytetrafluoroethylene together with at least one filled material selected from the group consisting of polyimide resins, polyamide-imide resins, and polyamide resins, from their aqueous dispersion, the improvement which comprises adding a water-insoluble organic liquid having a boiling point of from 30° to 150° C. and a surface tension of not more than 35 dyne/cm at 20° C. to the aqueous dispersion under agitation at any stage after the initiation of the coagulation to the end of the coagulation.

4,451,617

MISCIBLE POLYBLEND AND MOLDED ARTICLE PRODUCED THEREFROM

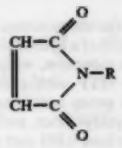
Bi L. Khac, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 16, 1982, Ser. No. 408,377

Int. Cl.³ C08L 39/04

U.S. Cl. 525—203 7 Claims

1. A miscible polyblend comprising a first and a second copolymer, the first copolymer consists of an α,β-ethylenically unsaturated dicarboxylic acid or its anhydride copolymerized with a monovinyl-substituted aryl hydrocarbon monomer and, the second copolymer consists of an imide derivative of maleic anhydride and having the general formula:



wherein R represents —CH_3, —CH_2H_5, —$C(CH_3)_3$, a phenyl or substituted phenyl group or a cycloalkyl or substituted cycloalkyl group copolymerized with a monovinyl substituted aryl hydrocarbon monomer.

4,451,618

BLOCK COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Yoshihisa Okamoto, Sagamore Hills, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,370

Int. Cl.³ C08F 297/00; C08G 65/12

U.S. Cl. 525—349 18 Claims

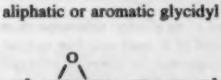
1. A block copolymer of a hydroxyl-terminated prepolymer (HTP) and an oxirane monomer, said block copolymer having the structure

$$R^1—O—[A]_a—H]_b \quad \text{(III)}$$

wherein,

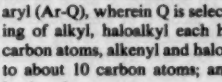
R^1 represents the residue of said HTP which originally contains from 1 to about 4 terminal aliphatic hydroxyl groups;

A represents the residue of a single ring-openable oxirane monomer selected from the group consisting of (i) an aliphatic or aromatic glycidyl ether having the structure



(I)

wherein R^2 and R^3 is each independently selected from the group consisting of hydrogen, alkyl having from 1 to about 40 carbon atoms, haloalkyl, alkenyl having from 2 to about 40 carbon atoms, haloalkenyl, alkoxyalkyl having from 1 to about 40 carbon atoms, aryl (Ar) or substituted aryl (Ar-Q), wherein Q is selected from the group consisting of alkyl, haloalkyl each having from 1 to about 10 carbon atoms, alkenyl and haloalkenyl each having from 2 to about 10 carbon atoms; and, (ii) a haloalkyl epoxide having the structure



(II)

wherein

X is halogen atom and R^4 and R^5 is each independently

selected from the group consisting of hydrogen and alkyl having from 1 to about 4 carbon atoms;

so that the molecular weight of the resulting block copolymer is directly proportional to the amount of monomer converted; and,

a represents an integer in the range from about 5 to about 100;

b represents an integer in the range from 1 to about 4;

so that the molecular weight of each of the segments of the copolymer is in the range from about 500 to about 10,000, and the molecular weight of the block copolymer is in the range from about 500 to about 500,000.

6. The block copolymer of claim 1 wherein segment A, and, optionally, R^1, contains a reactive halogen capable of an addition reaction with an amine to yield an aminated block copolymer.

11. A process for the manufacture of a block copolymer having the structure (III) of a hydroxyl-terminated prepolymer (HTP) and an oxirane monomer, which process comprises,

(i) polymerizing, a HTP with a single oxirane monomer selected from the group consisting of an acyclic glycidyl ether, a cyclic glycidyl ether, and a haloalkyl epoxide, in the presence of at least 0.001 part per 100 parts by weight of oxirane reactants of a catalyst selected from the group consisting of an HMF_6 acid, and, an oxonium salt of the HMF_6 acid, wherein M is an element selected from the group consisting of phosphorus, arsenic and antimony, at a temperature in the range from about 0° C. to about 100° C., and,

(ii) recovering said block copolymer which is formed in an amount directly proportional to the conversion of monomer.

4,451,619
METHOD OF HYDROPHILIZING OR HYDROPHOBIZING POLYMERS

Steven M. Heilmann, North St. Paul; Jerald K. Rasmussen, Stillwater, and Frederick J. Palensky, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 30, 1982, Ser. No. 429,986

Int. Cl.³ C08F *8/30*

U.S. Cl. 525—379 **9 Claims**

1. A method for preparing thermoplastic, processable, hydrophilic- or hydrophobic-modified polymers comprising the steps:

(a) interpolymerizing at a temperature in the range of room temperature to 100° C. in the presence of an amount of free radical initiator in the range of 0.01 to 5.0 weight percent

(1) 1 to 50 mole percent of an alkenyl azlactone monomer,

(2) 50 to 99 mole percent of at least one free radical addition polymerizable monomer, to form an interpolymer, said monomer being selected from the group consisting of vinyl aromatic compounds, α,β-unsaturated carboxylic acids and their derivatives, vinyl esters of carboxylic acids, vinyl halides, olefins, N-vinyl compounds, vinyl ketones, and vinyl aldehydes;

(b) reacting in a ring-opening reaction at room or moderate temperatures in an unreactive solvent said resulting interpolymer with 0.1 to 1.0 equivalents, based on polymer-bound azlactone, of an alcohol- or amino-functional hydrophilic or hydrophobic nucleophile having a molecular weight greater than 100, said hydrophilic nucleophile having a Hydrophilicity Index greater than 30 or said hydrophobic nucleophile having a Hydrophilicity Index less than 20, and having the formula

HXG

wherein

H is hydrogen,

X is equal to —O—, or

and wherein R^8 is equal to H, G, or G', wherein G' is any other hydrophilic or hydrophobic group other than G, or an alkyl group having from 1 to 4 carbon atoms,

G is any hydrophilic group such that its Hydrophilicity Index has a value of at least 30 or G is any hydrophobic group such that its Hydrophilicity Index has a value of 20 or less, and G' is equal to G or can differ from G, provided that G' is alike in kind with G and the Hydrophilicity Index for the hydrophilic group or the hydrophobic group falls within the respective limitations for G;

with the proviso that said reacting step takes place in the presence of 0.01 to 5.0 weight percent of a Bronsted or Lewis acid catalyst when said hydrophilic nucleophile is alcohol-functional; and

(c) recovering the resulting hydrophilic- or hydrophobic-modified polymer.

4,451,620
DIETHANOLAMINE SALT OF SULPHAMIC ACID AS A CURING ACCELERATOR FOR AMINOPLAST RESINS

Steffen Piesch, Oberursel, and Peter Dörries, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,723

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218231

Int. Cl.³ C08G *6/00*; C08L *61/02*

U.S. Cl. 525—398 **12 Claims**

1. In the process for curing modified aminoplast resins containing at least 3% by weight, relative to solid resin, of a modifying agent and at least one latent curing agent by the application of heat, the improvement comprises said curing agent comprises diethanolammonium sulphamate.

4,451,621
HEAT RESISTANT RESIN COMPOSITION COMPRISING MODIFIED POLYAMIDE-IMIDE RESIN HAVING CARBOXYL GROUPS

Kazuya Yonezawa; Kazuaki Kira; Hiroshi Wakabayashi, and Hirosaku Nagano, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 167,335, Jul. 9, 1980, Pat. No. 4,387,192.

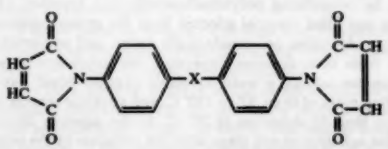
This application Dec. 23, 1982, Ser. No. 452,432

Claims priority, application Japan, Jul. 13, 1979, 54-89626

Int. Cl.³ C08G *73/10*

U.S. Cl. 525—426 **2 Claims**

1. A heat resistant resin composition comprising the reaction product of (1) a polyamide imide resin having carboxyl groups produced from at least one aromatic polycarboxylic acid anhydride having at least three functional carboxyl groups and at least one organic diisocyanate, (2) a compound selected from the group consisting of N-methylolated acrylamide, N-methoxymethylacrylamide, N-butoxymethylacrylamide, N-methylolated methacrylamide and N-butoxymethylmethacrylamide, and (3) a bismaleimide represented by the formula



where X is CH_2, O, SO_2, S or $C(CH_3)_2$; said compound (2) being used in an amount of 1.0 to 5.0 mol equivalent weights per mole equivalent weight of the carboxyl groups in the polyamide imide resin and the bismaleimide, and (3) being used in an amount of 5 to 50% by weight per 100% by weight of the unmodified polyamide imide resin.

4,451,622
URETHANE PREPOLYMERS CROSSLINKED WITH AMINO CROSSLINKING AGENTS

Edward DiDomenico, Jr., Anoka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 12, 1983, Ser. No. 484,248
Int. Cl.³ C08L *75/04*
U.S. Cl. 525—456 **8 Claims**

1. A composition of matter comprising (i) a hydroxy-terminated urethane prepolymer derived from a polyisocyanate and a polyol selected from the group consisting of hydroxymethyl polyols of the formulae:

$$H(CH_2)_hCH(CH_2OH)(CH_2)_kCH_2OH \quad (I)$$

and

$$CH_3(CH_2)_m[C(CH_2OH)_2]_n(CH_2)_p[C(CH_2OH)_2]_q(CH_2)_r[C(CH_2OH)_2]_s(CH_2)_tCH_2OH \quad (II)$$

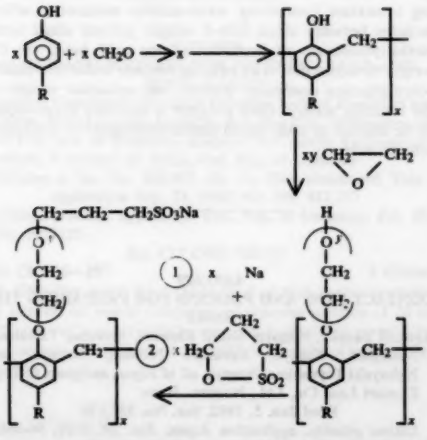
wherein n plus q plus s are integers, the sum of which is from 1 to 3; n, q and s are 0 or 1; m through t are integers, the sum of which is 12 to 20; and h and k are non-zero integers, the sum of which is 12 to 20 and (ii) a methylolamino compound.

4,451,623
WATER SOLUBLE PHENOLIC-FORMALDEHYDE POLYMER WHICH IS A SURFACTANT MOBILITY CONTROL AGENT IN OIL RECOVERY

Catherine S. H. Chen, Berkeley Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 225,573, Jan. 16, 1981, Pat. No. 4,374,740.
This application Sep. 22, 1982, Ser. No. 421,592
Int. Cl.³ C08G *8/28, 8/36*
U.S. Cl. 525—505 **8 Claims**

1. A process for manufacturing water-soluble polymers that thicken water comprising the following general reaction:



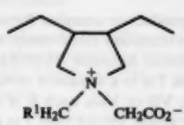
R is alkyl having from about 1 to 30 carbon atoms or aryl or alkylaryl,
x is 100 to 1000 and
y is 2 to 10.

4,451,624
POLYMERS, PREPARATION AND USE

John G. B. Howes, Hertford Heath, England, assignor to Smith and Nephew Associated Companies Ltd., England

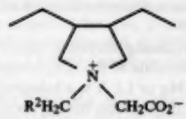
Filed Dec. 11, 1981, Ser. No. 330,013
Claims priority, application United Kingdom, Dec. 12, 1980, 8039934
Int. Cl.³ C08F *210/00*
U.S. Cl. 526—292.2 **8 Claims**

1. A polymer consisting essentially of 55 to 90% by weight of the formula (A):



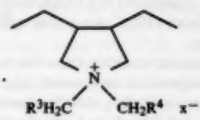
(A)

wherein R^1 is a hydrogen atom or an alkyl group of 1 to 3 carbon atoms; 10 to 45% of units of the formulae (B) and (C): up to 22% by weight of units of formula (B):



(B)

and 10 to 35% by weight of units of formula (C):



(C)

wherein R^2 is a hydrocarbon group of 5 to 19 carbon atoms, R^3 is a hydrogen atom or an alkyl group of 1 to 3 carbon atoms, R^4 is a hydrocarbon group of 5 to 19 carbon atoms and X^- is an anion.

4,451,625
REDUCTION OF WALL FOULING IN THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE HOMOPOLYMER

John T. C. Cheng, and Michael Langsam, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 5, 1982, Ser. No. 405,638
Int. Cl.³ C08F *2/20*
U.S. Cl. 526—62 **9 Claims**

1. In a suspension polymerization process wherein vinyl chloride monomer, water, a suspension agent and a monomer soluble polymerization catalyst is charged in stainless steel reactor at an initial pH above 6.0 and subsequently polymerized at an elevated temperature to produce a vinyl chloride homopolymer, the method for reducing wall fouling in the stainless steel reactor which comprises wetting the internal reactor surfaces with a solution consisting essentially of a solvent and

(a) 5 to 50 wt % alkali metal hydroxide,
(b) 0.01 to 1 wt % free radical inhibitor, and
(c) 0.01 to 1 wt % surface active agent.

4,451,626

PROCESS FOR POLYMERIZING ALPHA-OLEFINS

Randall S. Shipley, Alvin, and Donald F. Birkelbach, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 313,869, Oct. 22, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,559
Int. Cl.³ C08F 4/02, 10/00
U.S. Cl. 526—122 35 Claims

1. A process for polymerizing one or more polymerizable α-olefins which process comprises conducting the polymerization under Ziegler polymerization conditions in the presence of a catalyst which is a catalytic reaction product of

(A) a reaction product or complex formed from the admixture of

(1) the reaction product or complex formed by mixing

(a) at least one transition metal compound represented by the empirical formulae $Tm(OR)_4$ or $TM(OR)_{x-z}O$ wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; and x has a value equal to the valence of Tm; and

(b) at least one oxygen-containing compound selected from the group consisting of molecular oxygen, air, alcohols, ketones, aldehydes, carboxylic acids, esters of carboxylic acids, peroxides, water and mixtures thereof; and

(2) at least one reducing alkylating agent represented by the empirical formula $M'R_{a-b}X_b$ wherein M' is a metal selected from Mg or Li; X is a halogen; each R is independently an alkyl group having from 1 to about 20 carbon atoms; a has a value equal to the valence of metal M' and b has a value of from zero up to the valence of the metal M' minus 1; and wherein said mixture of (1) and (2) is subjected to a temperature of from about −50° C. to about 110° C. for a time sufficient to effect a color change;

(B) a magnesium halide resulting from the reaction of

(1) an organomagnesium compound represented by the empirical formula $MgR''_2.xMR''_y$ wherein M is aluminum or zinc, each R'' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from

(a) an active non-metallic halide, said non-metallic halide corresponding to the empirical formula R'X wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, x is halogen, y is a number corresponding to the valence of M and a is a number of 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound is added which is represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three; and

wherein the components are employed in quantities which provide an atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; M':Tm of from about 0.1:1 to about 5:1; O:Tm of from about 0.1:1 to about 4:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.0005:1 to about 5:1.

4,451,627

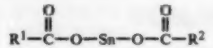
ADDITION POLYMERIZABLE URETHANE-BASED ANAEROBIC ADHESIVES MADE FROM TIN (II) ORGANOESTERS

Kurt C. Frisch, Jr.; Michele R. Lock, both of Midland City, and Gregory J. Stuk, Ann Arbor, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 7, 1982, Ser. No. 415,076
Int. Cl.³ C08F 4/06
U.S. Cl. 526—192 14 Claims

1. An adhesive comprising

a. the reaction product of (1) an isocyanate compound, and (2) an active hydrogen compound, wherein one of (1) or (2) has an addition polymerizable double bond, and the other is polyfunctional, or both (1) and (2) have addition polymerizable double bonds, said reaction product having been formed in the presence of a catalytic amount of a tin (II) organoester according to the formula



wherein R^1 and R^2 each separately denote a hydrogen or an organic radical;

b. a curing amount of a polymerization initiator; and

c. a stabilizing amount of a polymerization inhibitor.

4,451,628

PROCESS FOR PREPARING LOW MOLECULAR WEIGHT WATER-SOLUBLE POLYMERS BY COPOLYMERIZING WITH WATER-SOLUBLE MONOMERS A CALCULATED QUANTITY OF METHALLYLSULFONATE MONOMER

Laurence G. Dammann, Crestwood, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,249
Int. Cl.³ C08F 2/16, 2/38
U.S. Cl. 526—225 11 Claims

1. A process for preparing a water-soluble polymer of controlled low molecular weight which comprises copolymerizing a mixture comprising water-soluble monomers, which includes between about 0.01–5 weight percent alkali metal methallylsulfonate or methallylsulfonic acid based on the weight of monomers, in an aqueous medium under free radical polymerization conditions wherein the molecular weight of the resulting water-soluble polymer is inversely proportional to the amount of alkali metal methallylsulfonate or methallylsulfonic acid.

4,451,629

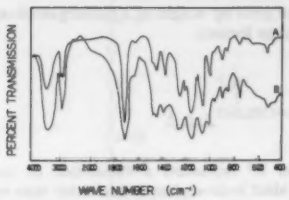
CONTACT LENS AND PROCESS FOR PREPARING THE SAME

Kyoichi Tanaka, Nagoya; Shinji Kanome, Kuwana; Tatsutoshi Nakajima, Nagoya; Kazuhiko Nakada, Nagoya, and Nobuyuki Toyoshima, Nagoya, all of Japan, assignors to Toyo Contact Lens Co., Ltd., Nagoya, Japan

Filed Jan. 5, 1982, Ser. No. 337,170
Claims priority, application Japan, Jan. 12, 1981, 56-3681; Oct. 15, 1981, 56-165224
Int. Cl.³ C08F 16/38; G02C 7/04
U.S. Cl. 526—238.23 6 Claims

1. A water-absorptive contact lens made of a copolymer

comprising acrylate or methacrylate units having saccharides as side chains and units of at least one member selected from



the group consisting of a hydrophilic monomer and a hydrophobic monomer.

4,451,630

HYDROGEL CONTACT LENSES FOR PERMANENT WEAR

Ivor B. Atkinson, 90 Queens Dr., and Barry C. Holdstock, Flat 12, Kingston Ct., 82 Maple Rd., both of Surbiton, Surrey, England

Filed Jun. 16, 1983, Ser. No. 505,419

Claims priority, application United Kingdom, Apr. 29, 1983, 8311788

Int. Cl.³ C08F *26/06, 126/06, 226/06*

U.S. Cl. 526—261 **3 Claims**

1. A process for the preparation of a contact lens comprising a hydrogel having a water content from about 50% to 85% by weight of water, which process comprises polymerizing, in the presence of an azo type initiator, a monomer mixture comprising from 25% to 50% by weight of N-vinyl pyrrolidone, up to 5% by weight of methacrylic or acrylic acid, 0.1 to 1% by weight of 1,3,5-tris(propenoxy)-2,4,6-triazine (TPT), or perhydro-2,4,6,-triketo-1,3,5-tris(propene-2)-1,3,5-triazine (T.T.P.T.), as a cross-linking monomer, the balance being essentially hydroxy alkyl acrylate or methacrylate, wherein the alkyl group is ethyl or propyl and subsequently swelling in aqueous medium.

4,451,631

AGENT AND METHOD FOR DEOILING SAND AND ROCK MASSES

Friedrich Engelhardt; Hermann Schmitz, both of Frankfurt am Main; Walter Gulden, Hofheim, and Jörg Hax, Wiesbaden, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

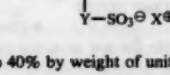
Division of Ser. No. 283,497, Jul. 15, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,277

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027422

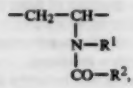
Int. Cl.³ C08F *228/00*

U.S. Cl. 526—287 **9 Claims**

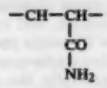
1. Clay-free agent for deoiling sand or rock masses containing mineral oil which comprises an aqueous solution of 20 to 5,000 ppm of a water-soluble copolymer consisting essentially of a random distribution of 5 to 60% by weight of units of the formula



2 to 40% by weight of units of the formula



and 38 to 93% by weight of units of the formula



and hydrolysates thereof

wherein

R^1 and R^2 are identical or different and each is hydrogen, methyl, ethyl, or together are trimethylene;

Y is —CO—NH—$C(CH_3)_2$—CH_2— or a direct bond; and $X^{\oplus}$ is a cation.

4,451,632

HIGH VINYLIDENE CHLORIDE CONTENT INTERPOLYMER COATING RESINS AND METHOD OF PREPARATION

Dale S. Gibbs, and Warren L. Treptow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 277,305, Jun. 25, 1981, abandoned. This application Jul. 6, 1982, Ser. No. 395,442

Int. Cl.³ C08F *14/08*

U.S. Cl. 526—317 **14 Claims**

1. A process for preparing, in aqueous emulsion, controlled interpolymer compositions having polymerized therein (a) from about 86 to about 92 mole percent vinylidene chloride; (b) from about 14 to about 8 mole percent of a mixture of methyl methacrylate and a comonomer selected from the group consisting of acrylonitrile, methacrylic acid, and methacrylonitrile, said mixture of methyl methacrylate and the comonomer having a molar ratio of the comonomer to methyl methacrylate of from about 0.2:1 to 5:1; and (c) from about 0.5 to about 1.0 weight percent itaconic acid based on weight of (a) plus (b); said interpolymer compositions having a relative viscosity of from about 1.3 to about 1.7 at 25° C. as a 1 percent solution in tetrahydrofuran; said interpolymer compositions being capable of forming generally haze-free solutions when present in an amount of about 20 percent solids in a solvent mixture, said solvent mixture comprising about 65 weight percent tetrahydrofuran based on solvent mixture weight, and about 35 weight percent toluene based on solvent mixture weight, said process comprising the sequential steps of:

(A) initiating emulsion polymerization by forming a seed latex, the seed latex being formed in a batch emulsion polymerization process which comprises:

(1) adding a first monomer charge to an aqueous emulsion polymerization medium, the first monomer charge comprising from about 3 to about 8 weight percent of a principal mixture of monomers, the principal mixture of monomers comprising from about 86 to about 92 mole percent vinylidene chloride and from about 14 to about 8 mole percent of a comonomer mixture of methyl methacrylate and a comonomer selected from the group consisting of acrylonitrile, methacrylic acid, and methacrylonitrile, said comonomer mixture having a molar ratio of the comonomer to methyl methacrylate of from about 0.2:1 to about 5:1, the polymerization medium comprising water, an emulsifier and from about 0.5 to about 1.0 weight percent itaconic acid based on the principal mixture of monomers;

(2) adding a polymerization initiator to said emulsion polymerization medium, the initiator being added at a generally constant rate;

(3) continuing seed latex formation under autogenous

pressure until a pressure drop in vapor pressure of monomers in the polymerization medium of from about 1.8 to about 2.2 pounds per square inch occurs;

(B) continuing polymerization under autogenous pressure by adding to the emulsion polymerization medium:

(1) a second monomer charge in an amount between about 85 and 92 weight percent of the principal mixture of monomers as in (A)(1), said second monomer charge being added at a generally constant rate, the rate being sufficient to continually provide an excess of unreacted monomers in the polymerization medium, said excess being generally from about 2 to about 10 weight percent based on weight of the polymerization medium; and

(2) the polymerization initiator at generally the same constant rate of addition as in (A)(2); and

(C) generally immediately following addition of all of the second monomer charge, finishing polymerization in a predetermined time interval T, the time interval T having at least a first portion and a second portion, by:

(1) continuing to add the polymerization initiator at generally the same constant rate of addition as in (A)(2) and (B)(2), the initiator being added throughout the time interval T; and

(2) adding a third monomer charge in an amount between about 2 and 12 weight percent of the principal mixture of monomers as in (A)(1), said third monomer charge being added over the first portion of the time interval T in such a manner that the vapor pressure of monomers in the emulsion polymerization medium is reduced smoothly as reflected by a time-pressure curve wherein time is plotted on the abscissa and pressure is plotted on the ordinate, the time-pressure curve being generally free of discontinuities from the beginning of the time interval T to the end thereof and having a shape, the shape being that of a line which is generally concave downward.

4,451,633

OLEFIN POLYMERIZATION

Thomas F. Brownscombe, and Carl L. Willis, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 19, 1982, Ser. No. 409,744
Int. Cl.³ C08F 2/02
U.S. Cl. 526—348.6 **23 Claims**

1. A method for producing an olefin polymer article which comprises substantially completely polymerizing an olefinic monomer feed selected from the group consisting of ethylene, C_3 to C_{12} aliphatic and cycloaliphatic alpha monoolefins, and mixtures thereof in contact with a coordination catalyst in a mold having the shape of the article, at conditions under which the polymer is produced as a coherent, useful article in the shape of the interior of the mold.

4,451,634

SILICONE ELASTOMER COMPOSITIONS SUITABLE FOR ULTRAVIOLET RAY CURING

Masayuki Hatanaka, Ora, and Atsushi Kurita, Ota, both of Japan, assignors to General Electric Company, Waterford, N.Y.

Filed Jan. 12, 1983, Ser. No. 457,348
Int. Cl.³ C08G 77/06
U.S. Cl. 528—24 **9 Claims**

1. Silicone elastomeric compositions suitable for ultraviolet ray curing comprising:

(A) 100 parts by weight of a polyorganosiloxane of the general formula:

$$(CH_3)_2R^1SiO—R_2^2SiO)_xSiR^1(CH_3)_2 \quad (1)$$

wherein R^1 represents hydrogen or a monovalent radical selected from the group consisting of methyl, vinyl, and hydroxy, R^2 represents hydrogen or a substituted or unsubstituted monovalent hydrocarbon radical, 0.02–49.95% based on the total number of R^1 and R^2 groups are vinyl radicals 0.05–49.98% based on the total number of R^1 and R^2 groups are hydrogen and n represents a number from 10–10,000

(B) 0.5–10 parts by weight of a polyorganosiloxane having an average formula:

$$(CH_2{=}CH)_aSiO\frac{R_b^3}{\frac{4-a-b}{2}}$$

wherein R^3 represents a substituted or unsubstituted monovalent hydrocarbon radical other than vinyl, a represents a number of $0.01 \leq a \leq 1$ in an average, and b represents a number of $0 \leq b < 3$ in an average, and a+b being a number from 1 to 3 inclusive, and

(C) 0.1–10.0 parts by weight a peroxyester of the general formula:

$$R^4—O—O—\overset{O}{\overset{\|}{C}}—R^5$$

wherein R^4 represents a substituted or unsubstituted monovalent aliphatic hydrocarbon group and R^5 represents a substituted or unsubstituted monovalent aromatic hydrocarbon radical.

4,451,635

POLYURETHANE QUATERNARY AMMONIUM SALTS

Francis E. Gould, Princeton, and Christian W. Johnston, Neshanic Station, both of N.J., assignors to Tyndale Plains-Hunter, Ltd., Princeton, N.J.

Filed Mar. 8, 1982, Ser. No. 355,938
Int. Cl.³ C08G 18/42
U.S. Cl. 528—71 **2 Claims**

1. A water soluble polyurethane quaternary ammonium salt characterized by having present in the polymer backbone hydroxyl groups and at least one substituent selected from the group consisting of carboxylate radicals and carboxyl radicals and the anion is a chloride ion.

2. A water soluble polyurethane quaternary ammonium salt characterized by having present in the polymer backbone hydroxyl groups and at least one substituent selected from the group consisting of carboxylate radicals and carboxyl radicals and the ion is a sulfate ion.

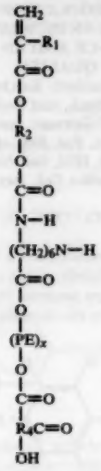
4,451,636

POLYMER COMPOSITION HAVING TERMINAL ALKENE AND TERMINAL CARBOXYL GROUPS

Jung-Hsien Tsao, Marietta, and Paul R. Hein, Atlanta, both of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 225,809, Jan. 16, 1981, Pat. No. 4,422,914. This application Sep. 29, 1982, Ser. No. 426,391
Int. Cl.³ C08G 18/10; C08F 283/00
U.S. Cl. 528—75 **9 Claims**

1. A polymer composition suitable for use as a hot melt having the formula:



wherein R_1 is hydrogen, methyl or ethyl, R_2 is alkyl of from 1 to 6 carbon atoms, -(PE)- is selected from the group consisting of polyethers, polyesters and mixtures thereof, x is an integer of from 2 to 50 and R_4 is alkyl, alkene, aryl or alicyclic.

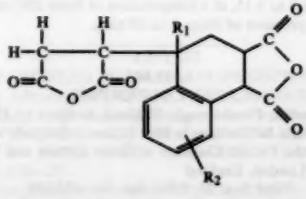
4,451,637

EPOXY RESIN COMPOSITION

Motoyuki Yamato, Oiso, and Tadao Natsuume, Yokosuka, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 463,024
Claims priority, application Japan, Feb. 8, 1982, 57-18372
Int. Cl.³ C08G *59/42*
U.S. Cl. 528—115 **8 Claims**

1. A heat-curable epoxy resin composition comprising (A) an epoxy resin and (B) an acid anhydride curing agent liquid at 20° C. composed of, based on acid anhydride equivalents, of 10 to 70% of a tetrabasic acid anhydride represented by the following formula



wherein

R_1 represents hydrogen or a methyl group, and

R_2 represents hydrogen or a lower alkyl group,

and 30 to 90% of a liquid alicyclic dibasic acid anhydride.

4,451,638

PROCESS FOR THE PRODUCTION OF ALKALI METAL POLYESTER SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 010,061, Feb. 7, 1979, Pat. No. 4,200,697, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Feb. 19, 1980, Ser. No. 122,015
Int. Cl.³ C08G *65/38*
U.S. Cl. 528—205 **6 Claims**

1. The process for the production of alkali metal polyester silicate resinous product by the following steps:

(a) mixing 1 to 10 parts by weight of alkali metal silicate, 10 to 30 parts by weight of a polyhydroxyl organic compound and 10 to 30 parts by weight of a polycarboxylic acid and/or a polycarboxylic acid anhydride,

(b) heating the mixture at a temperature between the melting temperature of the polycarboxylic acid and the boiling temperature of the polyhydroxyl organic compound while agitating for 20 to 90 minutes, thereby

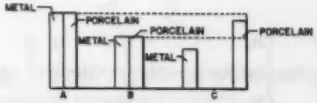
(c) producing an alkali metal polyester silicate resinous product.

4,451,639

DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 400,481, Jul. 21, 1982, abandoned. This application Aug. 31, 1983, Ser. No. 528,227
Int. Cl.³ C22C *5/04, 30/02*
U.S. Cl. 420—464 **20 Claims**



1. A grain-refined palladium based dental alloy for porcelain-fused-to-metal restorations consisting essentially of, on a weight basis, about 35–85% palladium, 0–12% copper, 5–15% gallium, 0–50% gold, 0–13% cobalt, 0.1–0.5% ruthenium, rhenium or mixtures thereof, and an effective amount of aluminum up to about 5% and an effective amount of zinc up to about 0.5% for the purpose of essentially eliminating the formation of bubbles in the porcelain during he porcelain firing process, the total of the constituents being 100%, wherein the components of the alloy are combined in a protective environment.

4,451,640

PROCESS FOR PRODUCING AROMATIC SULFIDE POLYMER

Zenya Shiiki, and Yukichika Kawakami, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 435,214, Oct. 19, 1982. This application Sep. 16, 1983, Ser. No. 532,759
Claims priority, application Japan, Oct. 20, 1981, 56-167573
Int. Cl.³ C08G *12/20*
U.S. Cl. 528—265 **6 Claims**

1. A process for producing an aromatic sulfide polymer, comprising the step of

reacting one gram-equivalent of elementary sulfur, 0.7 to 1.3 gram-equivalents of a polyhalogen-substituted aromatic compound, 0.6 to 1.4 gram-equivalents of an aldehyde or a condensate thereof and 1.2 to 2.5 gram-equivalents of a

caustic alkali in 0.02 to 5 liters of an organic solvent at a temperature of 100° to 300° C.

4,451,641

RADIATION-RESISTANT CONTAINER MATERIAL OF POLY(TETRAMETHYLENE TEREPHTHALATE)

Bobby J. Sublett, Kingsport, and Samuel D. Hilbert, Jonesboro, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,462
Int. Cl.³ C08G *63/48*
U.S. Cl. 528—295.5 **4 Claims**

1. A container characterized by improved resistance to gamma radiation comprising a copolyester derived from 100 mole % of a dicarboxylic acid component and 100 mole % of a glycol component, said copolyester consisting essentially of repeat units from terephthalic acid and 1,4-butanediol and about 15–50 mole % based on the total of 200 mole % of at least one compound selected from the group consisting of dimer acid and dimer glycol.

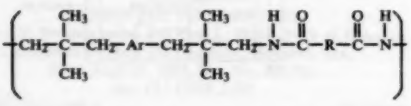
4,451,642

BIS(AMINONEOPENTYL) AROMATICS AND POLYAMIDES DERIVED THEREFROM

August H. Frazer, and John F. Harris, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 266,058, May 21, 1981, which is a continuation-in-part of Ser. No. 804,853, Jun. 8, 1977, abandoned. This application Sep. 20, 1982, Ser. No. 420,511
Int. Cl.³ C08G *69/26*
U.S. Cl. 528—347 **3 Claims**

1. Thermally stable, rigid polyamide having a repeating unit of the formula



in which Ar is arylene selected from the group consisting of 1,2-phenylene, 1,3-phenylene, 1,4-phenylene, 2,2′-biphenylene, 3,3′-biphenylene, 4,4′-biphenylene and 2,6-naphthylene, said arylene being unsubstituted or substituted with methyl or chloro, and R is Ar, alkylene of 1 to 20 carbon atoms, or oxygen-interrupted alkylene of 3 to 20 carbon atoms.

4,451,643

PRODUCTION OF ARYLENE SULFIDE POLYMER BEADS

James T. Edmonds, Jr., and Fred T. Sherk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 6, 1983, Ser. No. 456,185
Int. Cl.³ C08G *75/14*
U.S. Cl. 528—387 **8 Claims**

1. A method for producing arylene sulfide polymer in bead form comprising contacting lithium N-methyl-4-aminobutyrate (LiMAB) with at least one polyhalo aromatic compound and hydrogen sulfide (H_2S) in the presence of n-methyl-2-phrrolidone (NMP) under polymerization conditions including agitation of the reaction mixture wherein said LiMAB is present in a product mixture produced by the contacting of LiOH with NMP with the contacting compounds in a ratio of NMP:LiOH of about 2:1 to about 2.5:1 and said H_2S is then contacted with the product mixture in a ratio of initial NMP:H_2S of about 4.5:1 to about 5:1 and an LiOH:H_2S ratio of about 1.5:1 to about 2.5:1.

4,451,644

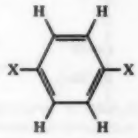
PROCESS FOR THE PRODUCTION OF POLYARYLENE (SULPHIDES) HAVING AN INCREASED THERMAL AND CHEMICAL RESISTANCE AND AN IMPROVED COLOR QUALITY

Edgar Ostlinning, Duesseldorf; Karsten Idel, Krefeld; Otto Neuner, Bergisch-Gladbach, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

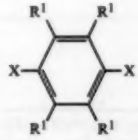
Filed Feb. 8, 1983, Ser. No. 465,010
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205995
Int. Cl.³ C08G *75/14*
U.S. Cl. 528—388 **4 Claims**

1. A process for the production of a high molecular weight, branched polyarylene sulphide which comprises reacting

(a) at least one dihalogen benzene, from 50 to 100 mol % of which corresponds to the formula



and from 0 to 50 mol % of which corresponds to the formula



wherein X represents fluorine, chlorine, bromine or iodine, and each R^1 is the same or different and represents hydrogen, C_1–C_{20} alkyl, C_5–C_{20} cycloalkyl, C_6–C_{24} aryl, C_7–C_{24} alkaryl or C_7–C_{24} aralkyl or two adjacent radicals are joined to complete an aromatic or heterocyclic ring and the other two R^1 radicals are either joined to complete an aromatic or heterocyclic ring or are each hydrogen, or the aforesaid alkyl, cycloalkyl, aryl, alkaryl or aralkyl radicals, at least one radical R^1 being other than hydrogen,

(b) from 0.2 to 2.4 mol % based on (a) of a compound of the formula ArX_n wherein Ar represents an aromatic or heterocyclic radical having from 6 to 24 carbon atoms, X is as aforesaid and n is 3 or 4 and

(c) at least one alkali metal sulphide, or a mixture thereof with an alkali metal hydroxide, the mol ratio of (a+b):c being from 0.85:1 to 1.15:1, in

(d) at least one cyclic urea which is completely alkylated on each nitrogen atom, the mol ratio of (c) to (d) ranging from 1:2 to 1:15, at a temperature of from 250° to 290° C. and a pressure of from 4 to 20 bars.

4,451,645

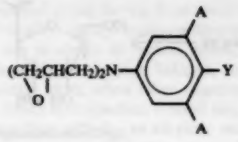
EPOXY COMPOUNDS

Peter Johncock, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

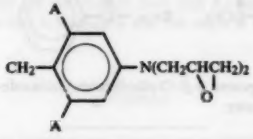
Filed Sep. 24, 1982, Ser. No. 423,318
Claims priority, application United Kingdom, Oct. 1, 1981, 8129618
Int. Cl.³ C08G *59/28, 59/30, 59/32*
U.S. Cl. 528—391 **22 Claims**

1. An epoxy compound including one or two aromatic rings,

one N-diglycidyl group per aromatic ring and one or two halogen or polyfluoroalkyl or polyfluoroalkoxy groups per aromatic ring, the epoxy compound having the general formula:



in which Y is selected from A and



each A being independently selected from halogen, a polyfluoroalkyl group, or a polyfluoroalkoxy group and H, at least one of the groups A per aromatic ring being a halogen, a polyfluoroalkyl or a polyfluoroalkoxy group.

4,451,646

HIGH MOLECULAR WEIGHT POLYMERIC PERFLUORINATED COPOLYETHERS AND PROCESS FOR THEIR PREPARATION FROM TETRAFLUOROETHYLENE

Dario Sianesi; Adolfo Pasetti, and Giorgio Belardinelli, all of Milan, Italy, assignors to Montedison, S.p.A., Milan, Italy

Continuation of Ser. No. 786,477, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 277,412, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 702,533, Feb. 2, 1968, Pat. No. 3,715,378. This application May 29, 1979, Ser. No. 42,863

Claims priority, application Italy, Feb. 9, 1967, 12460 A/67; Aug. 5, 1971, 27198 A/71

Int. Cl.³ C08G *63/76, 67/00*

U.S. Cl. 528—401 **3 Claims**

1. A high molecular weight perfluorinated polymeric copolyether, the macromolecules of which have a chain structure consisting essentially of $—CF_2—CF_2—O—$ and $—CF_2—O—$ repeating units, said perfluorinated polymeric copolyether having a molecular weight of from 22,000 to about 75,000, said repeating units being randomly distributed along the chain and linked one to another either directly or through an oxygen atom in which latter case a peroxy group is present along the chain, the ratio of the total $—CF_2—CF_2—O$ units to the total $—CF_2—O—$ units being between about 0.2 and 25, the peroxidic oxygen content being up to 10 parts by weight per 100 parts of the copolyether, and the average sum of all the repeating units present along the chain being from 220 to 624.

4,451,647

HEPARINIZED POLYORGANOPHOSPHAZENES

Harry R. Allcock, and Thomas X. Neenan, both of State College, Pa., assignors to Research Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,344

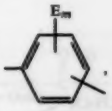
Int. Cl.³ A61K *31/725;* **C08B** *37/10*

U.S. Cl. 536—21 **24 Claims**

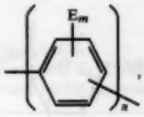
1. A polyphosphazene-bound heparin complex, comprising:

a polymeric phosphazene backbone,

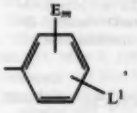
a quaternary ammonium ion covalently attached to said backbone through a divalent organic radical attached at one end to the nitrogen atom of said ion and at the other end to a phosphorus atom of said backbone, and heparin ionically bound to said quaternary ammonium ion, wherein said divalent organic radical has the formula —AL— or —AM—, wherein A represents —O— or —NH—, L represents a divalent C_2–C_{12} alkyl group or a divalent C_2–C_{12} alkyl group substituted by a halogen atom or —CN or interrupted by —O— or a divalent organic functional group of the formula —COO—, —CONR—, —RC=CR—, —C≡C—,



or —CO—, wherein each R independently represents hydrogen or a C_1–C_4 alkyl group, m is an integer from 0 to 4, and each E independently represents a halogen atom, $—NO_2$, —CN, or —R, and M represents a divalent aryl radical of the formula



wherein n is 1 or 2, or



wherein L^1 is L or $—CH_2—$, and A is directly bonded to a phosphorous atom of said backbone.

4,451,648

PROCESS FOR THE PRODUCTION OF 2-β-D-RIBOFURANOSYLTHIAZOLE-4-CARBOXAMIDE

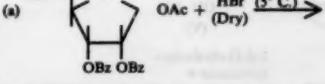
Jack L. Parsons, East Aurora; Dan Vizine, Tonawanda, both of N.Y.; Mark Sumner, Chatham, N.J.; Suresh Marathe, Tonawanda, N.Y., and Henryk Dubicki, Lancaster, N.Y., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 19, 1981, Ser. No. 294,368

Int. Cl.³ C07G *37/00;* **C07H** *37/00;* **C08B** *37/00*

U.S. Cl. 536—54 **8 Claims**

1. A multi-step process for the production of 2-β-D-ribofuranosylthiazole-4-carboxamide (NSC-D286193) utilizing the following steps:



Tri-O—benzoyl-α-acetyl-D-ribofuranose

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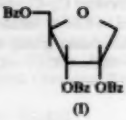
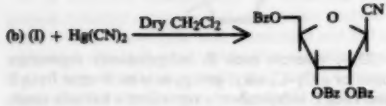


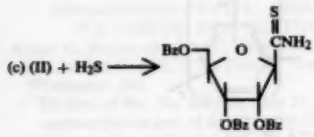
(I)

2,3,5-Tri-O—benzoyl-D-ribofuranosyl bromide



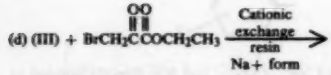
(II)

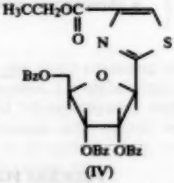
2,3,5-Tri-O—benzoyl-β-D-ribofuranosyl cyanide



(III)

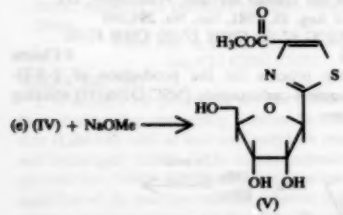
2,5-Anhydro-3,4,6-tri-O—benzoyl-D-allonthioamide





(IV)

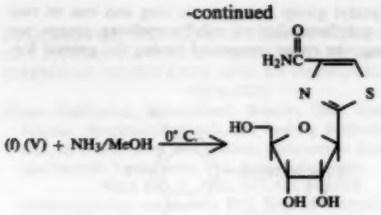
Thiazole-4-carboxylic acid, 2-(2',3',5'-tri-O—benzoyl-β-D-ribofuranosyl)-, ethyl ester



(V)

2-β-D-ribofuranosylthiazole-4-carboxylic acid, methyl ester

-continued



2-β-D-ribofuranosylthiazole-4-carboxamide

Where: Ac = $-\overset{O}{\overset{\|}{C}}CH_3$ Bz = $-\overset{O}{\overset{\|}{C}}$

8. The compound 2-β-D-ribofuranosylthiazole-4-carboxylic acid, methyl ester.

4,451,649

PROCESS FOR THE PRODUCTION OF HYDROXYPROPYL STARCH

Helwig Teubner, Hanau, and Wilhelm Oppermann, Bomlitz, both of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 428,853

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1981, 3141499

Int. Cl.³ C08B *31/12*

U.S. Cl. 536—111 **5 Claims**

1. A process for the production of hydroxypropyl starch having a molar substitution degree of 0.4 to 0.8, said process comprising etherifying starch in the presence of water with an excess of propylene oxide, the water content, based on propylene oxide and water, being 10–20%, by weight, and the amount of propylene oxide present being 3–10 moles per mole of starch.

4,451,650

PYRIDO[4,3-b][1,4]OXAZINES AND PYRIDO[4,3-b][1,4]THIAZINES

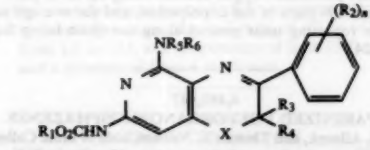
Carroll G. Temple, Jr.; John A. Montgomery; Robert D. Elliott, and Glynn P. Wheeler, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Oct. 26, 1982, Ser. No. 436,667

Int. Cl.³ C07D *498/04, 513/04*

U.S. Cl. 544—105 **21 Claims**

1. 2H-Pyrido[4,3-b][1,4]oxazines and 2H-pyrido[4,3-b][1,4]thiazines having the formula:



wherein n has a value of 1, 2 or 3; X is oxygen or sulfur; R_1 is a lower alkyl group; R_2 is a member selected from the group consisting of hydrogen, alkyl radicals having from about one to about 12 carbon atoms; alkenyl radicals having from about two to about 15 carbon atoms; cycloalkyl radicals having from about three to about 20 carbon atoms; aryl, aralkyl and alkaryl radicals having from about six to about 20 carbon atoms; a halogen radical; a hydroxyl group; an amino group; an alkoxy

or aryloxy group, a carboxyl group or an alkylcarboxyl group having from about one to about 10 carbon atoms; an alkylthio group or an arylthio group having from about one to about 20 carbon atoms; a sulfonic acid group or alkyl- or arylsulfonyl group having from about one to about 20 carbon atoms; an alkyl- or arylsulfinyl group having from about one to about 20 carbon atoms; an alkyl- or aryl mono- or diamino group having froom about one to about 20 carbon atoms; a hydrocarbyl group as defined above carrying halogen, hydroxyl, amino, alkoxy or aryloxy; nitro; when taken together with the aromatic ring to which it is attached, a fused ring structure; and, when taken together with R_3, an alkylene radical containing from about one to about 12 carbon atoms; R_3 is hydrogen, methyl, phenyl or, when taken with R_2, an alkylene radical as previously defined; R_4 is hydrogen or methyl; R_3 and R_4, when taken together are the radical =O; and R_5 and R_6 are both hydrogen, or one is hydrogen and the other is the radical

or when taken together are the radical $=CHN(CH_3)_2$.

4,451,651
PREPARATION OF ISOCYANURIC ESTERS

Johannes Brand, Schalkhaar, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Nov. 4, 1982, Ser. No. 439,140
Claims priority, application Netherlands, Nov. 4, 1981, 8104978
Int. Cl.³ C07D 251/34
U.S. Cl. 544—221 5 Claims

1. A process of preparing isocyanuric esters by catalytic isomerization of the corresponding cyanurates in the absence of a solvent that dissolves in the isocyanuric esters, characterized in that as catalyst one or more compounds of the following formulae are used:

$$[R_nNH_{4-n}]^+X^-, \quad (1)$$

wherein n=1, 2, 3 of 4,

$$[R_pPH_{4-p}]^+X^-, \quad (2)$$

wherein p=3 of 4,

$$[R'C_5H_4NR'']^+X^-, \quad (3)$$

wherein C_5H_4N is a pyridine ring,

$$[R_1R_2R_3S]^+X^-, \quad (4)$$

wherein X=halogen or hydroxide,

R=an alkyl group having 1–18 carbon atoms, an alkenyl group having 1–18 carbon atoms, a phenyl group or benzyl group, with the compounds 1 and 2 containing not more than one phenyl group or benzyl group,

R'=hydrogen, an alkyl group having 1 to 4 carbon atoms or an alkenyl group having 1 to 4 carbon atoms,

R''=an alkyl group having 1 to 18 carbon atoms, or an alkenyl group having 1 to 18 carbon atoms,

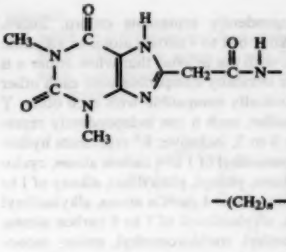
R_1, R_2 and R_3=an alkyl group having 1 to 18 carbon atoms, an alkenyl group having 1 to 18 carbon atoms or phenyl.

4,451,652
SUBSTITUTED THEOPHYLLINE SALTS

Charles A. Flentge, Vernon Hills, and Curtis L. Kirkemo, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 24, 1982, Ser. No. 380,981
Int. Cl.³ C07F 9/65
U.S. Cl. 544—229 5 Claims

1. A compound of the formula:



(II)

wherein

n is an integer of from 2 to 6;

R and R' are independently C_1–C_4 alkyl; and

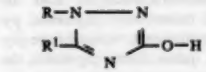
Z is a biologically compatible counter ion.

4,451,653
HETEROCYCLIC SUBSTITUTED TRIAZOLYL PHOSPHOROUS COMPOUNDS

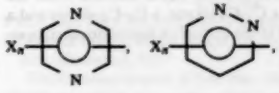
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

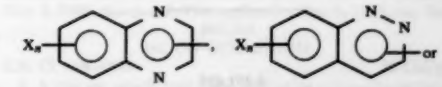
Division of Ser. No. 260,527, May 4, 1981, Pat. No. 4,400,516, which is a continuation-in-part of Ser. No. 951,923, Oct. 13, 1978, abandoned. This application Nov. 12, 1982, Ser. No. 440,934
Int. Cl.³ C07D 237/30, 241/10
U.S. Cl. 544—238 7 Claims

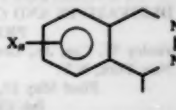
1. A compound corresponding to the formula



wherein R represents a nitrogen containing heterocyclic radical corresponding to the formulae

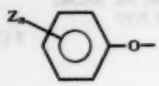






each X independently represents chloro, fluoro, bromo, nitro, alkyl of 1 to 4 carbon atoms, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4

carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, cyano, trifluoromethyl, trichloromethyl, phenoxy or substituted phenoxy of the formula



wherein each Z independently represents chloro, fluoro, bromo, nitro, cyano, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; Y represents oxygen or sulfur; each n can independently represent an integer of from 0 to 3, inclusive; R^1 represents hydrogen, chloro, fluoro, bromo, alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylthio, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, thiocyanato, trifluoromethyl, trichloromethyl, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms.

4,451,654

CONDITIONING OF FINELY DIVIDED CRUDE ORGANIC PIGMENTS

Fritz Graser, Ludwigshafen, and Gerhard Wickenhaeuser, Birkenheide, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 240,947, Mar. 5, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 380,042

Int. Cl.³ C09B *47/04, 47/30*

U.S. Cl. 546—34 **3 Claims**

1. A process for conditioning a crude organic pigment selected from the group consisting of phthalocyanine pigments, anthraquinone pigments, perylenetetracarboxylic acid diimides, quinophthalone pigments, indanthrone pigments, pyranthrone pigments, flavanthrone pigments, violanthrone pigments, isoviolanthrone pigments, quinacridone pigments, thioindigo pigments and indigo pigments, comprising:

recrystallizing said pigment as a finely divided material of agglomerates of a size ranging from 1–200 μm, the primary particles which constitute said agglomerates being of ≦0.2 μm, in a hot organic liquid selected from the group consisting of a C_3–C_5-alkane, a C_3–C_5-alkene and a C_1–C_3-chloroalkane in the critical or supercritical state up to 250° C.

4,451,655

PROCESS FOR PREPARING CARBOLINE DERIVATIVES AND COMPOUNDS USED IN THEIR PREPARATION

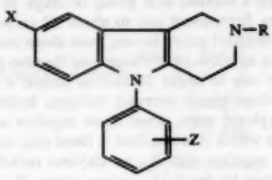
Berkeley W. Cue, Jr., Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 17, 1982, Ser. No. 378,945

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—85 **14 Claims**

1. A process for preparing a 2-substituted-5-aryl-1,2,3,4-tetrahydro-γ-carboline compound of the formula:

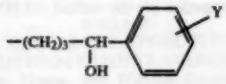


wherein

X is hydrogen, fluorine, chlorine or bromine;

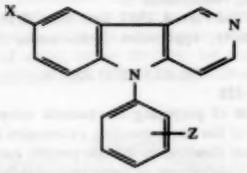
Z is hydrogen, fluorine, chlorine or methoxy; and

R is of the formula

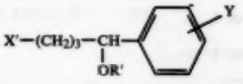


wherein Y is hydrogen, methyl, fluorine or chlorine, which comprises

(a) contacting a corresponding 5-aryl-γ-carboline of the formula



wherein X and Z are each as previously defined, in a reaction-inert polar organic aprotic solvent with at least an equimolar amount of an aralkyl halide of the formula



wherein X' is chlorine or bromine, Y is as aforesaid and R' is 2-tetrahydropyranyl, in the presence of a substantially equimolar amount of sodium iodide with respect to said aralkyl halide at a temperature ranging from at least about 60° C. up to the reflux temperature of the reaction mixture until the quaternization reaction to form the desired quaternary carbolinium iodide salt intermediate is substantially complete; and thereafter

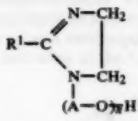
(b) subjecting the quaternary carbolinium salt formed in step (a) to the reducing action of an alkali metal hydride in a reaction-inert polar organic protic solvent at a temperature that is in the range of from about 10° C. up to about 35° C. until the reduction reaction to form the desired final product is substantially complete.

4,451,656
IMIDAZOLINE ADDITION COMPOUNDS

Erwin Dietz, Kelkheim, and Albert Münkel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

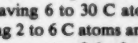
Filed Sep. 3, 1982, Ser. No. 414,813
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135327
Int. Cl.³ C07D 233/18
U.S. Cl. 548—352 5 Claims

1. An addition compound, obtainable from a hydroxyalkylimidazoline of the formula



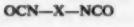
(1)

in which R^1 represents an alkyl, alkenyl or alkapolyenyl radical having 6 to 30 C atoms, A represents an alkylene radical having 2 to 6 C atoms and n represents a number from 1 to 20, a diisocyanate of the formula



(2)

wherein X represents a bivalent aromatic or araliphatic radical having 6 to 20 C atoms and a polyol of the formula



(3)

in which m represents a whole number from 2 to 6 and Y represents an aliphatic radical having at least 2 C atoms, which can be interrupted by —O—,

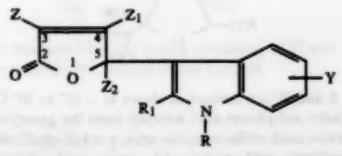
and —CO— groups and their combinations.

4,451,657
3,5- AND 5,5-BIS(3-INDOLYL)-2-(5H)FURANONES

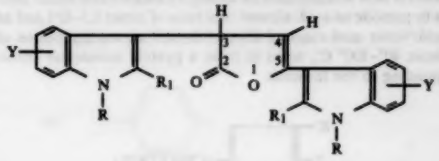
Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 829,002, Aug. 30, 1977, abandoned, which is a division of Ser. No. 651,607, Jan. 22, 1976, Pat. No. 4,075,224. This application Nov. 16, 1979, Ser. No. 94,794
Int. Cl.³ C07D 405/07
U.S. Cl. 548—456 11 Claims

1. A compound selected from the group consisting of 3-Z-4-Z_1-5-Z_2-5-(1-R-2-R_1-5/6-Y-3-indolyl)-2(5H)-furanones having the formula

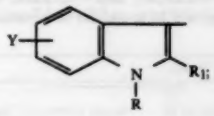


and 3,5-bis(1-R-2-R_1-5/6-Y-3-indolyl)-2(3H)-furanones having the formula



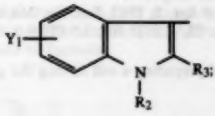
wherein:

Z when Z_1 is chlorine and Z_2 is other than hydrogen, represents chlorine, or when Z_1 and Z_2 are hydrogen, represents a monovalent 1-R-2-R_1-5/6-Y-3-indolyl moiety of the formula



Z_1 represents hydrogen or when Z is chlorine and Z_2 is other than hydrogen, represents chlorine;

Z_2 represents hydrogen or when Z is chlorine, a monovalent 1-R_2-2-R_3-5/6-Y_1-3-indolyl moiety of the formula



R represents hydrogen, non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

R_2 represents non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

R_1 and R_3 represent hydrogen, alkyl of one to three carbon atoms or phenyl; and

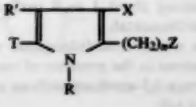
Y and Y_1 represent one or two of hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms, halo or nitro.

4,451,658
PROCESS FOR PRODUCING SUBSTITUTED PYRROLES

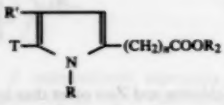
G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 209,950, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 203,052, Nov. 3, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,314
Int. Cl.³ C07D 207/333
U.S. Cl. 548—562 30 Claims

1. A process which comprises contacting one molar proportion of a 2,3-disubstituted pyrrole corresponding to the formula:



with a mixture of about 2–15 molar proportions of a strong mineral acid and amounts of an R_1OH alkanol and water such as to provide an acid/alkanol mol ratio of about 0.5–6/1 and an acid/water mol ratio of about 0.3–10/1 at a temperature of about 40°–100° C., so as to form a pyrrole monoester corresponding to the formula:



in which formulas n is an integer of 1–6; R, R', R_1, and R_2 are independently selected from lower alkyl groups; T is hydrogen or an aroyl group; and X and Z are independently selected from —COOH, —$COOR_3$, and —COOM, wherein R_3 is a lower alkyl group and M is sodium or potassium.

4,451,659

METHOD OF MAKING KNOWN AND PREVIOUSLY UNAVAILABLE PYRYLIUM SALTS

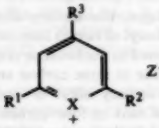
Kevin T. Potts, Schenectady, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,893

Int. Cl.³ C07D *309/32*; C07F *5/02*

U.S. Cl. 549—4 **11 Claims**

1. A method of preparing a salt having the general formula:



where X is oxygen;

R^1 and R^2 represent a branched or unbranched alkyl radical chain up to 15 carbon atoms; an aromatic group optionally substituted by alkyl radicals with from 1 to about 15 carbon atoms, alkoxy radicals having 1 to about 4 carbon atoms, or substituted amino radicals with 1 to 2 carbon radicals containing 1 to about 4 carbon atoms; a heterocyclic group optionally substituted by alkyl radicals with about 1 to 15 carbon atoms, alkoxy radicals having from 1 to about 4 carbon atoms or substituted amino radicals having 1 to 2 carbon radicals containing 1 to about 4 carbon atoms; 3-bromo phenyl; 5-chloro-2-thienyl; or 5-bromo-2-thienyl;

R^3 is a thioalkyl radical with from 1 to about 4 carbon atoms, thiobenzyl, thioaryl, thiocycloalkyl radicals and thioheteryl radicals; and

Z^- is an anionic function;

the method comprising:

condensing a methyl ketone with a carbon disulfide in the presence of sodium hydride;

treating the resulting product with alkyl halides or alkyl sulfate containing about 1 to 4 carbon atoms, to form α-oxoketenedithioacetal;

condensing the α-oxoketenedithioacetal with the same or another methyl ketone in the presence of two equivalents of a strong base to form a 1,5-enedione with an acid of the anionic function to form a salt.

4,451,660

NITROTHIOPHENES, FUNGICIDAL AND/OR BACTERICIDAL COMPOSITIONS CONTAINING NITROTHIOPHENES, AND USE THEREOF

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

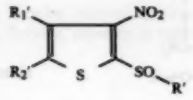
Continuation-in-part of Ser. No. 217,172, Dec. 16, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,758

Claims priority, application Netherlands, Dec. 19, 1979, 7909124

Int. Cl.³ C07D *333/00*; A01N *43/02*

U.S. Cl. 549—63 **6 Claims**

1. A compound of the formula



wherein

R' is C_1–C_4 alkyl,

R_1' is a hydrogen atom or C_1–C_4 alkyl, and

R_2' is a hydrogen atom or an acetyl group.

4,451,661

PREPARATION OF GAMMA-PYRONE INTERMEDIATES

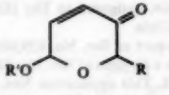
Paul D. Weeks, Gales Ferry, and Robert P. Allingham, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 371,932, Apr. 26, 1982, Pat. No. 4,390,709, which is a division of Ser. No. 741,112, Nov. 11, 1976, Pat. No. 4,342,697, which is a continuation-in-part of Ser. No. 608,452, Aug. 28, 1975, abandoned. This application Mar. 24, 1983, Ser. No. 478,507

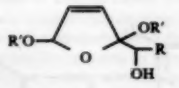
Int. Cl.³ C07D *309/22*

U.S. Cl. 549—417 **6 Claims**

1. A process for preparing a compound of the formula:



wherein R is hydrogen, lower alkyl of 1 to 6 carbon atoms, lower alkenyl of 2 to 6 carbon atoms, phenyl or benzyl; and R' is lower alkyl of 1 to 6 carbon atoms which comprises contacting a compound of the formula



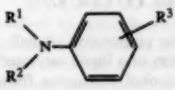
wherein R and R' are defined as above at −10° to 50° C. with an essentially anhydrous acid selected from the group consisting of formic acid, trifluoroacetic acid, p-toluenesulfonic acid, methanesulfonic acid, citric acid, oxalic acid, chloroacetic acid, sulfuric acid, hydrochloric acid, phosphoric acid and hydrofluoric acid.

4,451,662
PROCESS FOR PREPARING 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

Tsukasa Maekawa, and Takeshi Gondo, both of Tokushima, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Jun. 11, 1982, Ser. No. 387,604
Claims priority, application Japan, Sep. 1, 1981, 56-138240; Apr. 7, 1982, 57-58745
Int. Cl.³ C07D 307/86
U.S. Cl. 549—462 10 Claims

1. A process for preparing 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran which comprises subjecting o-methallyloxyphenol to a rearrangement and cyclization in the presence of, as a catalyst, aluminum halide and N-substituted aniline derivative of the formula



(I)

wherein

R^1 and R^2 are each alkyl having 1 to 6 carbon atoms or phenyl, or are joined together to form alkylene having 5 to 7 carbon atoms,

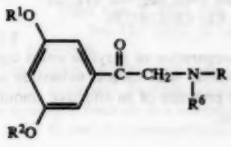
R^3 is hydrogen or alkyl having 1 to 3 carbon atoms, or a complex of both these compounds.

4,451,663
CARBAMATE INTERMEDIATES FOR BRONCHOSPASMOLYTICS

O. A. Torsten Olsson; Leif A. Svensson, both of Lund, and Kjell I. L. Wetterlin, Sandby, all of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

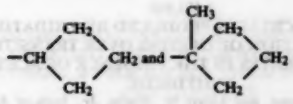
Division of Ser. No. 279,672, Jul. 1, 1981, Pat. No. 4,419,364. This application Jul. 6, 1982, Ser. No. 395,650
Claims priority, application United Kingdom, Jul. 9, 1980, 8022439; May 29, 1981, 8116441
Int. Cl.³ C07C 125/04, 125/067
U.S. Cl. 560—29 2 Claims

1. A compound of the formula



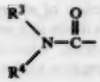
wherein

R is selected from the group consisting of —C(CH₃)₃,



R^1 is selected from the group consisting of H and R^2,

R^2 represents the radical of the formula



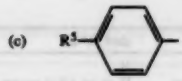
wherein

R^3 is selected from the group consisting of

(a) H

(b) alkyl groups containing 1–3 carbon atoms

(c)



wherein R^5 is selected from the group consisting of

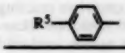
(a) OH

(b) alkoxy groups containing 1–3 carbon atoms and wherein

R^4 is selected from the group consistin of

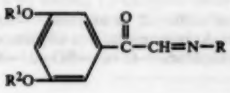
(a) H

(b) alkyl groups containing 1–3 carbon atoms with the proviso that R^3 and R^4 are combined as follows:

when R^3 is	then R^4 is
H	H
alkyl group of 1–3 carbon atoms	H or an alkyl group of 1–3 carbon atoms
	H

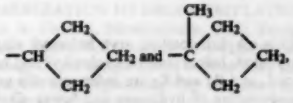
wherein R^6 is hydrogen or a mono or bicyclic aralkyl group containing not more than 11 carbon atoms.

2. A compound of formula



wherein

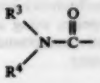
R is selected from the group consisting of —C(CH₃)₃,



wherein

R^1 is selected from the group consisting of H and R^2,

R^2 represents the radical of the formula



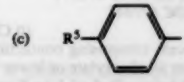
wherein

R^3 is selected from the group consisting of

(a) H

(b) alkyl groups containing 1–3 carbon atoms

(c)



wherein R^5 is selected from the group consisting of

(a) OH

(b) alkoxy groups containing 1–3 carbon atoms and wherein

R^4 is selected from the group consisting of

(a) H

(b) alkyl groups containing 1–3 carbon atoms with the proviso that R^3 and R^4 are combined as follows:

when R^3 is	then R^4 is
H	H
alkyl group of 1–3 carbon atoms	H or an alkyl group of 1–3 carbon atoms
	H

4,451,664

PROCESS OF MANUFACTURING DIARYL ESTERS OF DICARBOXYLIC ACIDS

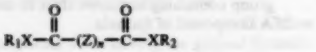
Gautam R. Ranade, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Sep. 24, 1982, Ser. No. 422,792

Int. Cl.³ C07C *67/08*

U.S. Cl. 560—86 **10 Claims**

1. In a process for preparing esters which comprises reacting a monohydroxy aromatic compound with at least one dicarboxylic acid in a reactor having a distillation means, said acid being represented by the formula:



wherein X is oxygen or sulfur, Z is alkylene, —Ar— or —Ar—Y—Ar— wherein Ar is aromatic, Y is alkylene of 1 to 10 carbon atoms, haloalkylene, —O—, —SO—, $—SO_2—$, $—SO_3—$, —CO—,

or GN=, and G is alkyl, haloalkyl, aryl, haloaryl, alkylaryl, haloalkylaryl, arylalkyl, haloarylalkyl, cycloalkyl and halocycloalkyl, n is 0 or 1, and R_1 and R_2 are independently selected from the group consisting of hydrogen and lower alkyl, said reaction being conducted at a temperature between about 220° to about 300° C., continuously removing a by-product of said reaction comprising water and/or lower alkyl alcohol(s) in admixture with said monohydroxy aromatic compound from said reactor through said distillation means, and supplying to said reactor a make-up amount of said monohydroxy aromatic compound, the improvement which comprises using as said make-up material a monohydroxy aromatic compound containing no more than about 100 ppm of water.

4,451,665

PROCESS FOR DIMERIZING ACRYLATES AND METHACRYLATES

William A. Nugent, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1982, Ser. No. 454,575

Int. Cl.³ C07C *67/343*

U.S. Cl. 560—202 **10 Claims**

1. Catalytic dimerization process comprising contacting, at about 0° to about 150° C., a lower alkyl acrylate or lower alkyl methacrylate, with lower alkyl being alkyl of 1 to 8 carbon atoms, with the catalyst which is the palladium complex of the formula $(RCN)_4PdX_2$ wherein R is hydrocarbyl which contains no carbon-carbon unsaturation other than aromatic unsaturation and X is an anion which is incapable of displacing RCN from the cationic moiety of the palladium complex, to produce dimer of the lower alkyl acrylate or methacrylate.

4,451,666

SYNTHESIS OF OXALATE ESTERS BY THE OXIDATIVE CARBONYLATION OF ALCOHOLS WITH A HETEROGENEOUS MANGANESE PROMOTED PD-V-P CATALYST

John A. Sofranko, and Anne M. Gaffney, both of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 6, 1982, Ser. No. 405,911

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 **13 Claims**

1. A process for the preparation of dialkyl oxalates by the oxidative carbonylation of a liquid saturated monohydric aliphatic or alicyclic alcohol containing from 1 to 20 carbon atoms with a mixture of carbon monoxide and oxygen or an oxygen-containing gas at a temperature of from about 40° C. to 150° C. and a total pressure of between about 500 psig and 6000 psig in the presence of a catalytic amount of an essentially insoluble tetra-metallic-containing heterogeneous catalyst comprising palladium or a salt thereof in combination with a crystalline vanadium oxide-phosphorus oxide-manganese oxide containing compound said catalyst containing as the metals an atomic ratio of palladium to vanadium to phosphorus to manganese of from about 0.003:1:0.5:0.1 to about 0.32:1:5:5 and recovering the desired dialkyl oxalate.

4,451,667

PREPARATION OF ACRYLATE ESTERS FROM VINYL HALIDES AND ORGANIC CARBONATES

Robert T. Klun, and Thomas W. Regulski, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 26, 1982, Ser. No. 411,725

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—207 **9 Claims**

1. A process for the preparation of acrylate esters comprising contacting a vinyl halide with carbon monoxide and an organic carbonate in the presence of an effective amount of a group VIII metal catalyst.

4,451,668

ALKANE ACETATES PRODUCED BY OXIDATIVE ESTERIFICATION OF OLEFINS OVER TRANSITION METAL BORATES IN THE PRESENCE OF ACETIC ANHYDRIDE

John R. Sanderson, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,664

Int. Cl.³ C07C *67/05*

U.S. Cl. 560—246 **17 Claims**

1. An improved process for the production of alkane hydroxy acetates and diacetates by reacting an olefin or a mixture of olefins with oxygen and acetic anhydride, wherein the improvement comprises conducting the reaction in the presence of a transition metal borate catalyst.

4,451,669
POLYIMIDE DERIVATIVES HAVING TERMINAL ACETYLENIC GROUPS

Gaetano F. D'Alelio, South Bend, Ind., and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 115,485, Jan. 25, 1980, Pat. No. 4,321,198. This application Nov. 16, 1981, Ser. No. 322,079
Int. Cl.³ C07C *101/42*
U.S. Cl. 562—442 14 Claims

1. A hemi-acid compound of the formula:

wherein:

Ar' is a tetravalent aromatic benzenoid radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical except that in the case of the Ar' being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

R' is an organic moiety containing 2 to 14 carbon atoms and having a terminal —C≡CH structure, said organic moiety consisting of a hydrocarbon radical or two or three hydrocarbon radicals joined by —O—, —SO_2— or —COO— groups;

R is an organic moiety containing one to 20 carbon atoms; said organic moiety consisting of a hydrocarbon radical or two or three hydrocarbon radicals joined by —O—, —SO_2— or —COO— groups;

Y'' is —OH or X; and

X is a halogen.

4,451,670
PREPARATION OF ISOBUTYRYL FLUORIDE

Dace Grote; Robert A. Grimm, and Richard V. Norton, all of Columbus, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 2, 1982, Ser. No. 438,443
Int. Cl.³ C07C *51/10, 51/04*
U.S. Cl. 562—606 3 Claims

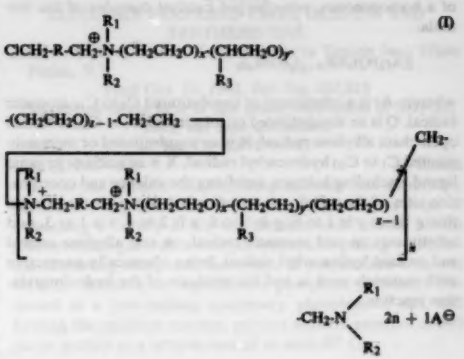
1. The process for preparing isobutyryl fluoride consisting of contacting isopropyl fluoride, carbon monoxide and anhydrous hydrogen fluoride at a temperature in the range of from 0° C. to 80° C. and at a pressure in the range of from 150 to 700 psi.

4,451,671
CATIONIC ETHYLENE OXIDE/PROPYLENE OXIDE AND ETHYLENE OXIDE/BUTYLENE OXIDE POLYMERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Helmut Diery, Kelkheim; Norbert Wester, Hofheim am Taunus, and Martin Hille, Lioderbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengeseilschaft, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,527
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136212
Int. Cl.³ C07C *91/26*
U.S. Cl. 564—286 2 Claims

1. A compound of the formula



(I)

wherein R is phenylene, R_1 and R_2 denote C_1–C_4-alkyl, R_3 denotes methyl or ethyl, x and z together denote a number from 2 to 360, y denotes a number from 15 to 70, preferably n denotes a number from 1 to 10 and A^- denotes an anion.

4,451,672
PREPARATION OF KETONES FROM 1,2-EPOXIDES

Roger A. Grey, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

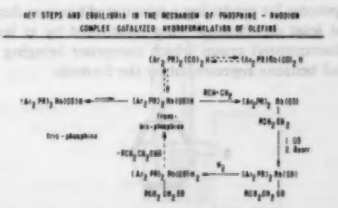
Filed Jan. 31, 1983, Ser. No. 462,253
Int. Cl.³ C07C *45/58*
U.S. Cl. 568—384 2 Claims

1. An improved process for the preparation of methyl ethyl ketone by adding 1,2-butylene oxide to an alkanol solution of dicobalt octacarbonyl, thereby effecting a rearrangement of the epoxide to the ketone, the improvement comprising using tertiary butyl alcohol as the alkanol solent.

4,451,673
TRIHYDROCARBYL SILYL SUBSTITUTED ALKYL DIARYL PHOSPHINE TRANSITION METAL COMPLEXES AND THEIR USE AS HOMOGENEOUS ISOMERIZATION HYDROFORMYLATION CATALYSTS

Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermansen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-Der Huang, Upper Saddle River, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 295,193, Aug. 21, 1981, which is a continuation-in-part of Ser. No. 192,810, Oct. 1, 1980, which is a division of Ser. No. 11,238, Feb. 12, 1979, Pat. No. 4,298,541. This application Sep. 29, 1982, Ser. No. 426,662
Int. Cl.³ C07C *45/50*
U.S. Cl. 568—454 5 Claims



1. A combined isomerization-hydroformylation process for converting an internal C_n olefin to C_{n+1} terminal aldehyde comprising reacting said internal C_n olefin with CO and H_2 at a temperature in the range of about 150° and 200° C. and a total

pressure in the range of about 500 to 2000 psia in the presence of a homogeneous, non-charged catalyst complex of the formula:

$$[(Ar_2PQ)_4SiR_{4-y}]_g(CoX_n)_s$$

wherein Ar is a substituted or unsubstituted C_6 to C_{10} aromatic radical, Q is an unsubstituted or substituted C_1 to C_{30} saturated open chain alkylene radical; R is an unsubstituted or monosubstituted C_1 to C_{10} hydrocarbyl radical, X is an anion or organic ligand, excluding halogen, satisfying the valence and coordination sites of the metal, y is 1 to 6, g is 1 to 6 with the proviso that g times y is 1 to 6, g is 1 to 6, n is 2 to 6, s is 1 to 3, said substituents on said aromatic radical, on said alkylene radical and on said hydrocarbyl radical, being chemically unreactive with materials used in and the products of the hydroformylation reaction.

4,451,674

SUBSTITUTED BENZENE DERIVATIVES HAVING AT LEAST ONE BENZENE RING SUBSTITUTED BY 3,3,3-TRIFLUOROPROPYL GROUP AND PROCESS FOR THEIR PRODUCTION

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachioji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

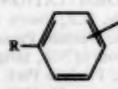
Continuation-in-part of Ser. No. 233,714, Feb. 12, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 412,963

Claims priority, application Japan, Feb. 22, 1980, 55-21094; Nov. 21, 1980, 55-164435; Dec. 29, 1980, 55-186563; Dec. 29, 1980, 55-186564

Int. Cl.³ C07C *43/263, 21/24, 17/32*

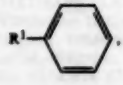
U.S. Cl. 568—639 **16 Claims**

1. A trifluoropropyl derivative of mono-substituted benzene represented by the general formula:



wherein R is halogen atom, trifluoromethyl-, n-octyl-, n-dodecyl- or phenoxy group not substituted or mono-substituted by 3,3,3-trifluoropropyl group, and n is an integer of 1,2 or 3, with the proviso that the total number of 3,3,3-trifluoropropyl group in said trifluoropropyl derivative of mono-substituted benzene is at most 3.

15. A process for producing a substituted benzene derivative having at least one benzene ring substituted by at least one 3,3,3-trifluoropropyl group which comprises bringing mono-substituted benzene represented by the formula



wherein R^1 is halogen atom, trifluoromethyl-, n-octyl, n-dodecyl or a phenoxy group, into reaction with 3,3,3-trifluoropropylene in the presence of an acid catalyst selected from the group consisting of hydrogen fluoride, boron trifluoride and a mixture thereof.

4,451,675

PREPARATION OF ALKYLIDENEBIS(DIBROMOPHENOL)

Charles T. Bounds, Magnolia, Ark., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 16, 1982, Ser. No. 398,747

Int. Cl.³ C07C *39/16, 37/62*

U.S. Cl. 568—726 **11 Claims**

1. A process for preparing alkylidenebis(dibromophenol) comprising

(a) dissolving alkylidenediphenol in between about 17 and 25 moles of methanol for each mole of alkylidenephenol wherein the methanol has less than about 5 percent by weight of water therein;

(b) adding to the solution between about 4.0 and 4.1 moles of bromine per mole of alkylidenediphenol at an elevated temperature wherein the bromine is added over a time period of less than about 0.5 hours;

(c) adding water to precipitate the alkylidenebis(dibromophenol) remaining in solution after the addition of the bromine in step (b) is completed;

(d) separating the alkylidenebis(dibromophenol) from the methanol solution wherein the alkylidenebis(dibromophenol) prepared has an APHA color number of 20 or less.

4,451,676

CHEMICAL PROCESS FOR THE PREPARATION OF PARA-ALKENYL PHENOL

Charles R. Everly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 27, 1982, Ser. No. 412,151

Int. Cl.³ C07C *39/18*

U.S. Cl. 568—780 **18 Claims**

1. A process for preparing a para-alkenyl phenol which comprises reacting at a temperature of from about 50° C. to about 250° C. an alkylated phenol having a replaceable hydrogen atom at the 4-position and at least one hydrocarbyl substituent ortho to the hydroxy group with an aliphatic aldehyde having from 2 carbon atoms up to at least 20 carbon atoms in the molecule and a secondary amine and separating the para-alkenyl phenol from the reaction mixture.

4,451,677

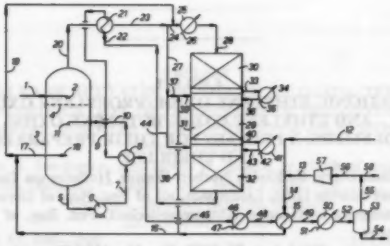
MULTISTAGE ALDEHYDE HYDROGENATION

Michael W. Bradley, Marton; Andrew G. Hiles, Sutton, and John W. Kippax, Ingleby Greenhow, all of England, assignors to Davy McKee (London) Limited, London, England

Continuation-in-part of Ser. No. 294,520, Aug. 20, 1981, abandoned. This application Aug. 20, 1982, Ser. No. 409,931

Int. Cl.³ C07C *29/14*

U.S. Cl. 568—881 **37 Claims**



1. A process for hydrogenating an aldehyde to a corresponding alcohol which comprises providing a plurality of adiabatically operated catalytic stages arranged one after another, including a first catalytic stage and one or more other catalytic

stages including a final catalytic stage, each catalytic stage containing a charge of a hydrogenation catalyst effective for vapour phase catalytic hydrogenation of aldehydes, supplying to the first catalytic stage at a temperature at least as high as the threshold temperature for the hydrogenation reaction a first vaporous mixture comprising vaporous aldehyde and excess hydrogen, allowing catalytic hydrogenation to occur substantially adiabatically in the first catalytic stage so as to convert to corresponding alcohol substantially all aldehyde supplied to the first catalytic stage, supplying to the, or to each, other catalytic stage a vaporous mixture comprising (a) a substantially aldehyde free intermediate product mixture comprising unreacted hydrogen and corresponding alcohol recovered from the preceding catalytic stage and (b) supplementary vaporous material that is richer in aldehyde than the first vaporous mixture and is selected from vaporous aldehyde and mixtures of vaporous aldehyde with hydrogen at a hydrogen:aldehyde molar ratio less than that of the first vaporous mixture, the vaporous mixture supplied to the, or to each, other catalytic stage being in each case at a temperature at least as high as the threshold temperature for the hydrogenation reaction, allowing catalytic hydrogenation to occur substantially adiabatically in the, or in each, other catalytic stage, thereby to convert to corresponding alcohol substantially all aldehyde supplied to that stage, and recovering from the final catalytic stage a substantially aldehyde-free vaporous reaction mixture containing corresponding alcohol.

4,451,678

PROCESS FOR PRODUCING ETHANOL

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,267
Claims priority, application Japan, Apr. 16, 1982, 57-62345
Int. Cl.³ C07C *31/08, 29/00*
U.S. Cl. 568—902 **9 Claims**

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and hydrogen in the presence of (a) a catalyst comprising cobalt or a cobalt compound and an alkyl phosphine as an effective component and (b) a co-catalyst comprising hydrochloric acid and in the absence of an iodide.

4,451,679

ALCOHOLS AND ALDEHYDES PREPARED FROM OLEFINS AND SYNTHESIS GAS

John F. Knifton, Austin; Jiang-Jen Lin, Round Rock; Robert A. Grigsby, Jr., Georgetown, and Walter H. Brader, Jr., Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,812
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.³ C07C *27/22*
U.S. Cl. 568—909 **28 Claims**

1. An oxo process for preparing alcohols and aldehydes, particularly aliphatic alcohols which comprises the steps of contacting a variety of C_2–C_{30} terminal and internal olefins plus synthesis gas with a catalyst system comprising a ruthenium-containing compound derivative dispersed in low-melting quaternary compound selected from the group consisting of quaternary phosphonium bases, quaternary phosphonium salts, quaternary ammonium bases and quaternary salts and heating resultant reaction mixture under a pressure of 100 psi or greater at a temperature of at least 50° C.

4,451,680

ALCOHOLS PREPARED FROM OLEFINS AND SYNTHESIS GAS

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,813
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.³ C07C *27/22*
U.S. Cl. 568—909 **23 Claims**

1. An oxo process for preparing alcohols and aldehydes, particularly aliphatic alcohols which comprises the steps of contacting a variety of C_2–C_{30} terminal and internal olefins plus synthesis gas with a catalyst system comprising a ruthenium-containing compound derivative in conjunction with one or more bidentate or multidentate phosphine promoters dispersed in a low-melting quaternary phosphinium salt, and heating the resultant reaction mixture under a pressure of 100 psi or greater at a temperature of at least 50° C.

4,451,681

METHODS OF PREPARING PENTANITROTOLUENE

Ronald L. Atkins; Richard A. Hollins; William P. Norris; Arnold T. Nielsen, all of Ridgecrest, Calif., and William S. Wilson, Greensborough, Australia, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1983, Ser. No. 456,672
Int. Cl.³ C07C *79/10*
U.S. Cl. 568—932 **12 Claims**

1. A process for preparing pentanitrotoluene comprising the steps of:

preparing an aminodinitrotoluene from a precursor;

nitrating said aminodinitrotoluene to form a nitramine;

converting said nitramine to an aminotetranitrotoluene; and

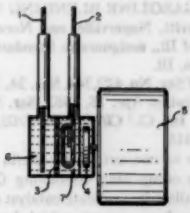
oxidizing said aminotetranitrotoluene to form pentanitrotoluene.

4,451,682

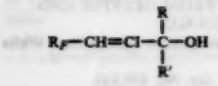
PROCESS FOR THE PREPARATION OF TRUE ACETYLENE HYDROCARBONS HAVING A PERFLUORINATED CHAIN

Patrick Calas, Montpellier; Patrice Moreau, Saint Gely Du Fesc, and Auguste Commeyras, Clapiers, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Dec. 2, 1982, Ser. No. 446,387
Claims priority, application France, Dec. 29, 1981, 81 24364
Int. Cl.³ C07C *17/33*
U.S. Cl. 570—142 **4 Claims**



1. Process for the preparation of true acetylene hydrocarbons with a perfluoroalkyl chain comprising dehydroiodinating the trans iodohydrin



wherein R_F is a straight or branched perfluoroalkyl chain, C_nF_{2n+1}—, n is 1 to 20, and R and R′ are identical or different alkyl radicals in the presence of alkali metal hydroxide in an alcohol medium to obtain the corresponding acetylenic alcohol, and distillating the acetylenic alcohol in the presence of solid alkali metal hydroxide to obtain $R_FC{\equiv}CH$.

4,451,683

CATALYST, CATALYST SUPPORT AND OXYCHLORINATION PROCESS

Phineas Davies, Middlesbrough; James R. Jennings, Yarm, and Jack Woistenholme, Northwich, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 8, 1982, Ser. No. 337,998

Claims priority, application United Kingdom, Jan. 15, 1981, 8101137; Jul. 14, 1981, 8121714

Int. Cl.³ C07C *17/02*

U.S. Cl. 570—224 **13 Claims**

1. An oxychlorination catalyst comprising a copper compound, magnesium oxide and aluminium oxide, characterised in that the copper compound is present as a distinct phase on a support comprising magnesium oxide and aluminium oxide, at least part of said magnesium oxide being in chemical combination with said alumina as a result of calcination of said support at a temperature in the range 400°–900° C.

4,451,684

CO-OLIGOMERIZATION OF OLEFINS

Joseph Z. Pasky, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 27, 1982, Ser. No. 402,490

Int. Cl.³ C07C *3/02*

U.S. Cl. 585—329 **5 Claims**

1. A process for the preparation of C_{20}–C_{40} branched-chain olefins by the co-oligomerization of a propylene oligomer feedstock having from 12 to 18 carbon atoms with C_5–C_6 olefins which comprises:

(a) contacting the propylene oligomer feedstock having from 12 to 18 carbon atoms with a C_5–C_6 olefin feedstock in a reaction zone in the presence of a boron trifluoride-alkanol catalyst;

(b) maintaining the temperature in the reaction zone between about 0° C. and 80° C.; and

(c) maintaining the pressure in the reaction zone between about 0 psig and 200 psig.

4,451,685

PROCESS TO CONVERT C_2–C_3 OLEFINS TO A GASOLINE BLENDING STOCK

Thomas D. Nevitt, Naperville, and Norman F. Jerome, Elmhurst, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 422,744, Sep. 24, 1982, abandoned. This application Apr. 15, 1983, Ser. No. 485,228

Int. Cl.³ C07C *3/00, 3/03, 3/62*

U.S. Cl. 585—415 **15 Claims**

1. A process to convert C_2–C_3 olefin to gasoline blending stock products comprising contacting C_2–C_3 olefin with an AMS-1B crystalline borosilicate catalyst composition which is in the hydrogen form or onto which has been placed one or more catalytically active materials selected from the group consisting of copper, lanthanum and zinc at a temperature of about 300° to about 500° C., a pressure of about 2 to about 40 atomospheres, a hydrogen to hydrocarbon molar ratio of 0.1 to about 10 and a weight hourly space velocity of about 0.3 to about 5 hr^{-1}.

4,451,686

DEHYDROGENATION PROCESS

Georges E. M. J. De Clippeleir; Raymond M. Cahen, both of Brussels, and Francisco A. Martins Mendes Cerejo, Ecaussinnes, all of Belgium, assignors to Cosden Technology, Inc., Dallas, Tex.

Filed May 9, 1983, Ser. No. 492,527

Int. Cl.³ C07C *5/36*

U.S. Cl. 585—444 **22 Claims**

1. A process for producing vinylaromatic hydrocarbons by dehydrogenation of alkylaromatic hydrocarbons on a crystalline silica which has been calcined under inert atmosphere and which contains from about 0.05 to about 1 wt% of alkali metal oxides.

4,451,687

CATALYST FOR THE HYDRODEALKYLATION OF ALKYLAROMATIC COMPOUNDS

Francis P. Daly, Haddonfield, N.J., and Frederick C. Wilhelm, West Chester, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 395,192, Jul. 6, 1982. This application Oct. 7, 1983, Ser. No. 540,214

Int. Cl.³ C07C *3/58*

U.S. Cl. 585—489 **10 Claims**

1. A process for the hydrodealkylation of an alkylaromatic hydrocarbon to the aromatic hydrocarbon which comprises contacting an alkylaromatic hydrocarbon feed stream with hydrogen under hydrodealkylation conversion conditions in the presence of a catalyst comprising a gamma-alumina impregnated with about 8 to 12 wt% chromium oxide and about 0.3 to 0.6 wt% sodium oxide, the catalyst having a surface area from 175 to 275 m^2/g and a pore volume from 0.05 to 1.2 cc/g.

4,451,688

PROCESS FOR PREPARING POLYOLEFINS

Nobuyuki Kuroda, Yokohama; Toru Nakamura, Kawasaki; Yutaka Shikatani, Yokohama; Kazuo Matsuura, Tokyo, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,829

Claims priority, application Japan, Dec. 3, 1981, 56-193687; Dec. 28, 1981, 56-209878

Int. Cl.³ C07C *3/21, 3/10*

U.S. Cl. 585—524 **9 Claims**

1. A process for preparing a polyolefin, characterized by polymerizing at least one olefin in the presence of a catalyst, said catalyst comprising the combination of:

[I] a solid substance obtained by the reaction of at least the following two components:

(i) at least one magnesium compound represented by the general formula $R^1_m(OR^2)_nMgX_{2-m-n}$ wherein R^1 and R^2 are each a hydrocarbon radical having 1 to 24 carbon atoms, X is a halogen atom, m is $0 \leqq m \leqq 2$ and n is $0 \leqq n \leqq 2$, provided $0 \leqq m+n \leqq 2$, and

(ii) a titanium compound and/or a vanadium compound;

[II] a silicon compound represented by general formula $R'_mSi(OR'')_nX_{4-m-n}$ wherein R′ and R″ are each hydrocarbon radical having 1 to 24 carbon atoms, X is a halogen atom, m is $0 \leqq m < 4$ and n is $0 < n \leqq 4$, provided $0 < m+n \leqq 4$; and

[III] an organometallic compound, wherein said catalyst comprises a product obtained by pre-reacting said silicon compound [II] and said organometallic compound [III].

4,451,689

CO-DIMERIZATION OF OLEFINS

Joseph Z. Pasky, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 27, 1982, Ser. No. 402,492
Int. Cl.³ C07C 3/02
U.S. Cl. 585—525 7 Claims

1. A process for the preparation of C_{18}–C_{42} branched-chain olefins by the co-dimerization of C_9–C_{21} branched-chain internal olefins which comprises:

(a) contacting a low molecular weight propylene oligomer feedstock having from 9 to 21 carbon atoms in a reaction zone with a catalyst selected from the group consisting of hydrogen fluoride, and aluminum chloride;

(b) maintaining the temperature in the reaction zone between about 0° C. and 75° C.; and

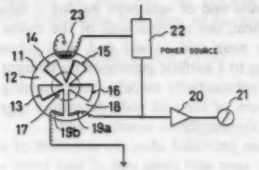
(c) maintaining the pressure in the reaction zone between about 0 psig to about 100 psig.

4,451,690

METHOD OF COMPENSATING A TEMPERATURE OF A THERMOPILE

Masaharu Ishida, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Aug. 30, 1982, Ser. No. 413,063
Claims priority, application Japan, Sep. 23, 1981, 56-151115
Int. Cl.³ H01L *35/34*
U.S. Cl. 136—201 1 Claim



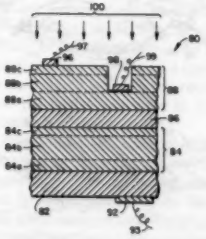
1. A temperature compensating method for a thermopile, wherein a heat sensitive portion is cooled or heated by Peltier's effect owing to an electric current therethrough from the outside and said electric current passing through said thermopile is simultaneously controlled in dependence upon a circumferential temperature of said thermopile.

4,451,691

THREE-TERMINAL TERNARY III-V MULTICOLOR SOLAR CELLS AND PROCESS OF FABRICATION

Lewis M. Fraas, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 352,680, Feb. 26, 1982, Pat. No. 4,404,421. This application Sep. 27, 1982, Ser. No. 424,937
The portion of the term of this patent subsequent to Sep. 13, 1900, has been disclaimed.
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—249 8 Claims



1. A three-terminal two-color solar cell comprising:
a conductive substrate;
a layer of $GaAs_{1-y}Sb_y$ having regions of differing conductivity forming a homojunction therein contacting said substrate and lattice matching the substrate to within about ±1%;
a transition layer of GaAs contacting the surface of said GaAsSb layer opposite to the surface contacting said substrate;
a layer of $GaAs_{1-x}P_x$ having regions of differing conductivity forming a homojunction therein and having a larger bandgap than said GaAsSb layer, said GaAsP layer contacting the surface of said transition layer opposite to said surface contacting said GaAsSb layer; and
means forming electrical contacts to said substrate, the incident surface of said GaAsP layer and the GaAsP region below the homojunction in said layer.

4,451,692

METHOD OF MANUFACTURING A LONGITUDINALLY WATERTIGHT CABLE AND LONGITUDINALLY WATERTIGHT CABLE THUS OBTAINED

Adrianus M. M. Classens, Delft; Frederik W. Aalbertsberg, and Hendrika G. Van Marle, both of Waddinxveen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 219,159, Dec. 22, 1980, abandoned.
This application Aug. 2, 1982, Ser. No. 404,155
Claims priority, application Netherlands, Jan. 8, 1980, 8000084
Int. Cl.³ B32B *25/20*; H01B *7/28*
U.S. Cl. 174—23 C 5 Claims

1. In a method of manufacturing a longitudinally watertight cable comprising positioning a number of conductors within a sheath, filling the space between the conductors mutually and between the conductors and the sheath with a liquid sealing mixture comprising 15–25% by weight of a vulcanizable silicone rubber, a diluent and a filler, said liquid sealing mixture being convertable to a watertight seal by vulcanization of the silicone rubber, then vulcanizing said silicone rubber to thereby convert said sealing mixture to a watertight seal between said conductors and between said conductors mutually, the improvement wherein the vulcanizable silicone rubber is a multicomponent silicone rubber vulcanizable at room temperature through an addition reaction in which no low molecular weight reaction products are formed, the diluent is a silicone oil and the filler is a salt of a higher fatty acid or a mixture of higher fatty acids with a bivalent or trivalent metal, said salt being present in an amount about at least 35% by weight.

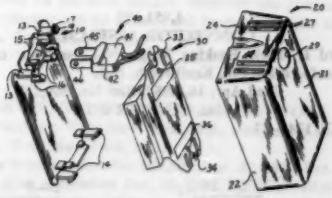
5. A longitudinally watertight cable obtained by the method of claim 1.

4,451,693

COMBINED BALLAST CONTAINER AND WALL PLUG FOR PORTABLE ELECTRICAL EQUIPMENT

Gary W. Vest, 4480 Broadview Rd., Cleveland, Ohio 44109

Filed Mar. 22, 1982, Ser. No. 360,408
Int. Cl.³ H05K *5/00*
U.S. Cl. 174—52 R 7 Claims

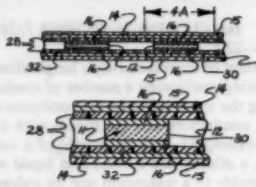


1. An electrical component and housing module for an electrical appliance circuit adapted to be plugged into a conventional electrical wall outlet comprising:
a relatively flat base plate formed of a dielectric material and defining an opening;
a cover formed of dielectric material and having walls defining a plurality of ventilation slots, said cover being adapted for assembly with said base plate to define therewith a protective enclosure;
first resilient means on said base plate cooperating with said slots for securing said cover to said base plate;
an electrical circuit component secured in said enclosure and forming a part of said electrical appliance circuit;
a wall-plug-type connector electrically connected to said circuit component and having an insulating body located in said enclosure and contact prongs extending through said opening; and
second resilient means on said base plate adjacent said opening cooperating with said insulating body for securing said connector to said base plate.

4,451,694
MINIATURIZED HIGH CAPACITANCE BUS BAR ASSEMBLY

William P. Harper, Phoenix, and Donald H. DeVries, Mesa, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 249,640, Mar. 31, 1981, Pat. No. 4,401,843.
This application Nov. 12, 1982, Ser. No. 440,752
Int. Cl.³ H01B 7/00
U.S. Cl. 174—72 B 2 Claims



2. A high capacitance bus bar assembly comprising:

at least two spatially separated bus bar conductors having inwardly facing planar surfaces;

a plurality of capacitors, said capacitors being arranged linearly and positioned between said bus bar conductors, said capacitors each comprising a dielectric material disposed between a pair of oppositely disposed planar conductive outer surfaces, said conductive outer surfaces of said capacitors being in electrical contact with respective of said bus bar conductor inwardly facing surfaces;

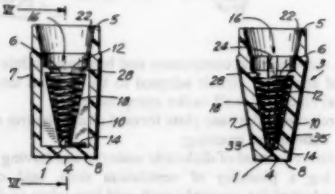
elastomeric strip means, said strip means being positioned between said capacitors conductive surfaces and said bus bar conductor inwardly facing surfaces, said strip means comprising alternating bands of conductive and non-conductive materials, said conductive material establishing electrical contact between said capacitors conductive surfaces and said bus bar conductor inwardly facing surfaces; and

means for securing said bus bar conductors, said capacitors and said elastomeric strip means in an assembly.

4,451,695
CONNECTOR ASSEMBLY

Richard R. Fink, Basking Ridge, N.J., assignor to Heyman Manufacturing Co., Kenilworth, N.J.

Filed Apr. 16, 1982, Ser. No. 369,238
Int. Cl.³ H01R 4/12
U.S. Cl. 174—87 11 Claims



1. A nylon connector assembly for metallic wires comprising:

a tapered spring coil member of stiff wire having a distended end at its apex projecting to the outside of said member in a direction in a plane vertical to the coil axis, said tapered spring coil member in a conical configuration, and said distended end comprising a short straight portion of said spring coil member's wire;

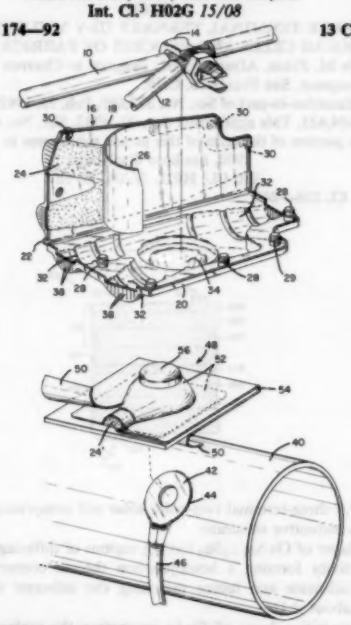
a nylon thermoplastic member having an elongated shell with a central bore, said bore having two ends, said bore closed at one end by an end wall and open at its other end, said open end of said bore substantially circular, the inside of said bore substantially tapered and adapted to house said tapered spring coil member, two grooves in the tapered inside wall of said bore, said grooves disposed substantially beginning nearest to the largest diameter of said taper of said bore coinciding with the wide base of said spring coil member within a plane passing through the central axis of said bore, and said grooves adapted to provide space and guidance during insertion and locking for said distended end of said tapered spring coil member, said closed end of said bore having a substantially elongated form, the outside wall of the nylon thermoplastic member near said closed end wall substantially corresponding to a surface generated by straight lines connecting the substantially circular bore opening and the elongated form of the end wall, providing a gripping surface on said thermoplastic member; and

a protrusion provided after the insertion of said coil spring member near said open end of said bore, said protrusion comprising a frozen ultrasonic weld line so shaped and dimensioned to retain a prior inserted tapered spring coil member at its wide base whereby said tapered coil spring is undislodgeable from said bore.

4,451,696
TOOLLESS SPLICE SEALANT DEVICE

Ernest L. Beinhaur, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 15, 1982, Ser. No. 441,340
Int. Cl.³ H02G 15/08
U.S. Cl. 174—92 13 Claims



1. A splice sealant device, comprising:

a cable splice covering;

at least one cable channel means disposed in said splice covering receiving at least one cable;

flowable sealant contained in said cable splice covering; and

at least one compression button means disposed on said splice covering, said compression button means being compressible for hydraulically urging the flowable sealant to flow through said channel, thereby adapted to substantially fill all voids around the cable so as to form an insulating seal therearound.

4,451,697

METHOD FOR ESTABLISHING CONNECTIONS BETWEEN SUBSCRIBER STATIONS WHICH OPERATE WITH DIFFERENT TRANSMISSION PROCEDURES BY WAY OF SIGNAL CONVERTERS INCLUDING BUSY-FREE CONTROL

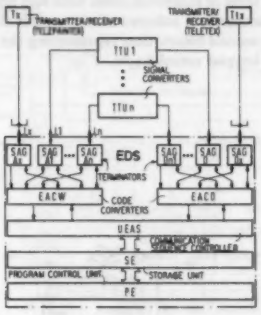
Dietmar Franz, Puchheim, and Norbert Torggler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,626

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030887

Int. Cl.³ H04L *11/06, 11/20*

U.S. Cl. 178—3 1 Claim



1. A method for establishing connections from subscriber stations and transmissions lines which are connected to a data exchange system and which process and transmit signals in accordance with different procedures to signal converters which are likewise connected to the data exchange system, and whose status signals, which indicate the free state or the engaged state, are stored in the data exchange system, wherein, on the occurrence of a connection request from a subscriber station or via a transmission line for the establishment of a connection to a signal converter, the presence of free status signals in the data exchange system is determined, and wherein, upon the seizure of the signal converter in question, a free status signal indicating the free state of a signal converter is charged into a busy state signal which is not reconverted into a free state signal until the signal converter in question again becomes available, comprising the steps of:

providing the free state signal as a control signal and separately storing the same in the signal converter;

transmitting the signal supplied for signal conversion and then emitting the free state signal from the signal converter, along with an accompanying signal indicating the end of signal transmission, to the data exchange system;

converting the busy state signal indicating the busy state of the signal converter to a free state signal and storing the same in the data exchange system; and

supplying to the data exchange system from the signal converter a control signal indicative of the busy state in the event that the signal converter is not serviceable.

4,451,698

COORDINATE DIGITIZING DEVICE

Albert L. Whetstone, Stratford, and Kerry L. Shaklee, Fairfield, both of Conn., assignors to Display Interface Corporation, Milford, Conn.

Filed Nov. 12, 1982, Ser. No. 440,848

Int. Cl.³ G08C *21/00*

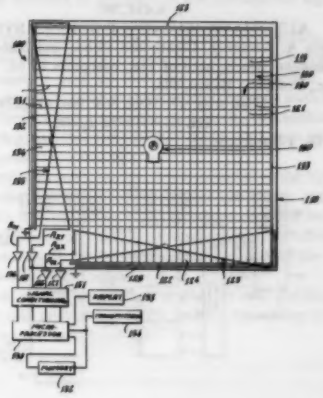
U.S. Cl. 178—19 37 Claims

1. A coordinate digitizer comprising:

(A) a first grid including a first plurality of conductive grid wires deployed spaced-apart on a data surface and end busses connecting the respective ends of the first grid wires;

(B) an inductor adapted for movement to positions of interest on said data surface and for inducing electrical signals into said first grid; and

(C) a first conductive receptor loop deployed proximate said first grid and configured to have induced therein from said first grid electrical signals which vary according to the position of the inductor on the data surface;



wherein, upon application of an alternating electrical input signal to said inductor, the inductor induces alternating electrical signals into said first grid, said electrical signals being distributed in the first grid wires according to the position of the inductor on the data surface, and the alternating electrical signals in the first grid induce an electrical output signal in the first receptor loop which varies according to the position of the inductor on the data surface, whereby the position of the inductor can be determined from the output signal in the first receptor loop.

4,451,699

COMMUNICATIONS SYSTEM AND NETWORK

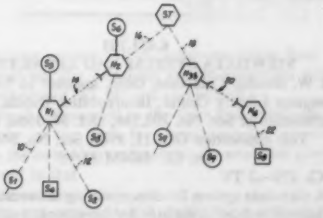
Elliot L. Gruenberg, West New York, N.J., assignor to Broad-Com, Inc., West New York, N.J.

Continuation-in-part of Ser. No. 108,552, Dec. 31, 1979, Pat. No. 4,337,376. This application Jun. 16, 1982, Ser. No. 389,033

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ H04M *11/00;* H04B *7/14, 7/20, 17/00*

U.S. Cl. 179—2 EB 10 Claims



9. A method for establishing a communications highway between at least two subscriber stations, with each subscriber station being associated with at least one node station, the method comprising the steps of; establishing a first retrodirec-

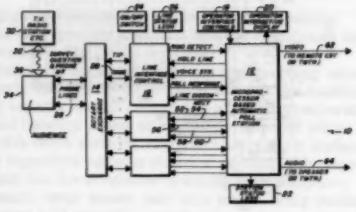
tive loop between one of said subscriber stations and an associated node station, establishing a second retrodirective loop between the other of said subscriber stations and an associated node station, establishing a third retrodirective loop between two node stations and transferring information between said subscriber stations via said first, second and third retrodirective loops, said first, second and third retrodirective loops being interdependent and being established substantially simultaneously.

4,451,700

AUTOMATIC AUDIENCE SURVEY SYSTEM

Marvin A. Kempner, Lighthouse Point, and Robert E. Elder, Pompano Beach, both of Fla., assignors to M. A. Kempner, Inc., Pompano Beach, Fla.

Filed Aug. 27, 1982, Ser. No. 412,079
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 AS **34 Claims**



1. A telephone based single phone number accessed automatic audience survey system for obtaining information representative of the opinion of an audience regarding a question of interest from a plurality of individuals of said audience, comprising in combination:

a first means for holding a plurality of phone lines in an off-hook condition in response to individuals of said audience calling said single phone number;

a second means operatively connected to said plurality of phone lines in said off-hook condition for providing a voice-message to each of said plurality of phone lines simultaneously which asks each such individual for a response in one of at least two selectable categories in regard to said question of interest;

a third means operatively connected to said phone lines in said off-hook condition for storing data in preselected data latches that respectively correspond to said selectable categories in accordance with the particular responses of the individuals; and

a fourth means connected to said preselected data latches for tabulating said data representative of the particular responses of the individuals of said audience to provide composite data representative of the opinion of said audience.

4,451,701

VIEWDATA SYSTEM AND APPARATUS

Mark W. Bendig, Columbus, Ohio, assignor to OCLC Online Computer Library Center, Incorporated, Dublin, Ohio

Continuation of Ser. No. 202,189, Oct. 30, 1980, abandoned. This application Oct. 11, 1983, Ser. No. 540,701
Int. Cl.³ H04M *11/08*
U.S. Cl. 179—2 TV **17 Claims**

1. A viewdata system for disseminating information from the data base of a host computer by telephonic communication, comprising:

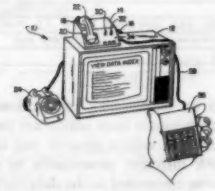
a host computer responsive to the establishment of telephone communication therewith from along a telephonic linkage for sending a carrier signal along said linkage, and having selectable programs each accessible for interactive communication along said telephonic linkage upon receipt of a predetermined logon sequence of characters transmitted thereto by telephone communication;

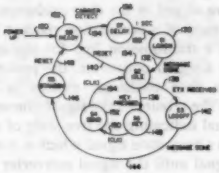
a decoder comprising:

coupling means for establishing a first level of communication by said telephonic linkage with said host computer wherein said carrier signal is received therefrom, and for subsequently effecting the telephonic reception from and transmission of data signals to said host computer;

keypad means having a plurality of manually actuable keys, each being identified with and corresponding to a function serving to interactively communicate with said host computer;

memory means for retaining first binary data representing a said logon sequence of characters selected for deriving a second level of communication with said host computer to effect access to a selected said program thereof, and retaining second binary data representing the said functions of said keypad means keys;





circuit means responsive to said coupling means reception of said carrier signal for commencing a finite delay interval of predetermined duration, and responsive at the termination of said delay to address said memory means first binary data and effect the transmission thereof by said coupling means so as to carry out said second level of communication, said circuit means thereafter being responsive to a said actuation of said keypad means keys for addressing said memory means second binary data corresponding therewith and effecting the transmission thereof by said coupling means to said host computer, and responsive to said data signals received by said coupling means from said host computer for generating output signals corresponding therewith; and

modulator means, having an output connectable with the input of a visual readout display, for modulating said output signals with a select carrier to effect a display of character images corresponding therewith at said readout display.

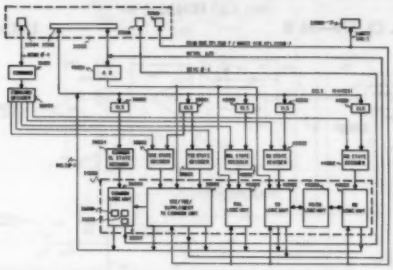
4,451,702
ARRANGEMENT OF INTERACTIVE TELEPHONE SWITCHING PROCESSORS FOR PERFORMING TIMING ANALYSES OF PORT EVENTS

Barrie Brightman, Fern Park; Thomas E. Ellis, Altamonte Springs, both of Fla.; James E. Jones, Littleton, Colo.; Pedro A. Lenk, Fern Park, Fla.; Jayantkumar R. Shah, Longwood, Fla.; William H. Stewart, Longwood, Fla., and John W. Woodward, Longwood, Fla., assignors to Stromberg-Carlson Corporation, Lake Mary, Fla.

Continuation of Ser. No. 63,601, Aug. 2, 1979, abandoned, which is a continuation of Ser. No. 924,882, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,401, Dec. 27, 1977, abandoned. This application Jun. 18, 1981, Ser. No. 275,072

Int. Cl.³ H04M *3/22*; H04Q *3/54*

U.S. Cl. 179—18 ES **19 Claims**



15. A common control for a telephone switching system that includes a plurality of port means for establishing communications over telephone lines by means of voice signals and supervisory signals, said common control comprising:

A. a port event processor that connects to each said port means and that includes:

(i) first selectively adjustable timing means for detecting the presence of a supervisory signal at a said port means for a variable minimum period of time, and

(ii) second selectively adjustable timing means for detecting the presence of a supervisory signal at a port means for a variable maximum period of time, and

B. a call control processor connected to said port event processor for independently adjusting said first timing and second timing means thereby to alter respectively the variable minimum and variable maximum periods of time.

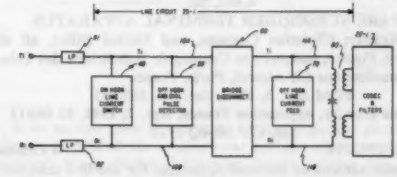
4,451,703
ALL ELECTRONIC INTERFACE FOR TELEPHONY SYSTEM

Barrie Brightman, and Frank Niertit, both of Casselberry, Fla., assignors to Stromberg-Carlson Corporation, Lake Mary, Fla.

Filed Dec. 30, 1981, Ser. No. 335,648

Int. Cl.³ H04M *3/22*

U.S. Cl. 179—18 FA **13 Claims**



11. A line circuit for interconnecting a subscriber line having a far end connected to a subscriber set and a switching system and for coupling intelligence signals, including voice signals, therebetween in a telephony system, the subscriber line including both tip and ring conductors, the line circuit comprising:

A. connection means including:

i. tip and ring bilateral current gate means connected to said tip and ring conductors respectively for selectively coupling intelligence signals therethrough, each of said tip and ring bilateral current gate means including a plurality of diodes connected to form (a) input and output junctions that define a unidirectional current path through said bilateral current gate means and (b) balance point junctions that connect in the path of the intelligence signals; and

ii. bias current means connected to the switching system and the tip and ring bilateral current gate means for providing bias current to said tip and ring bilateral current gate means in response to an enabling signal from the switching system, thereby to forward bias said diodes and enable the tip and ring bilateral current gate means to couple intelligence signals therethrough;

B. a hook switch condition detector connected to the tip and ring conductors between said connection means and the subscriber set, said hook switch condition detector including means responsive to the subscriber set going off-hook for generating an off-hook signal indicating that the subscriber set has gone off-hook; and

C. a power source connected to the tip and conductors between said connection means and the subscriber set for energizing the subscriber line.

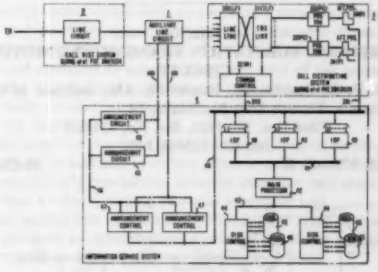
4,451,704
SWITCHING SYSTEM AUXILIARY LINE TRANSFER CIRCUIT

Max D. Winkelman, Westerville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1982, Ser. No. 364,787

Int. Cl.³ H04M *3/22, 3/50*; H04Q *3/64*

U.S. Cl. 179—18 F **21 Claims**



1. A switching system **(3)** for interconnecting lines with attendant positions, the switching system associated with an announcement circuit **(47, 49)** and comprising

line circuits **(1, 2)** coupled to the lines and responsive to a seized one of the lines for connecting the seized line through the switching system with the attendant positions characterized in that

said line circuits comprise

means **(100, 101, 102, 103, 117, 1402)** for transferring said seized line from the switching system to the announcement circuit, and

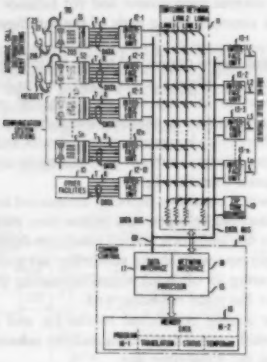
means **(104, 105, 116, 1412, 1413)** for releasing the announcement circuit and reconnecting said seized line through the switching system with the attendant positions.

4,451,705

CALL COMPLETION CIRCUIT AND METHOD

Edmund T. Burke, West Long Branch; Patrick H. Gorman, II, Little Silver; James A. Henderson, Jr., Neptune, and Nicholas K. Smith, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1982, Ser. No. 383,315
Int. Cl.³ H04Q *3/64, 3/72*
U.S. Cl. 179—27 D **8 Claims**



6. An automatic call distributing system having a plurality of terminals, each terminal having an identity used by said system for the completion of communication connections thereto, said system comprising

means for accepting from an attendant at any terminal a unique identification code assigned to that attendant,

means for temporarily associating an accepted attendant identification code from a particular terminal with said particular terminal,

means including said temporarily associated attendant identification code for assigning said terminals to splits, and

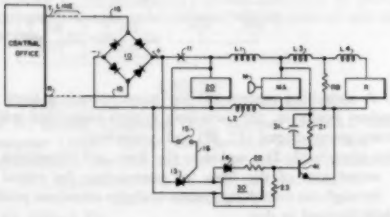
means for completing calls to a particular terminal in accordance with the availability of said terminal to answer said calls.

4,451,706

TELEPHONE SUBSTATION TRANSMITTER MUTING CIRCUIT

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 20, 1982, Ser. No. 451,589
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—81 R **10 Claims**



1. A transmitter muting circuit for use in a subscriber substation said subscriber station including a hold circuit and a transmission circuit having a positive and a negative terminal, a handset transmitter, and a hookswitch contact, said contact connecting said transmission circuit to a central office and a central office battery via a subscriber line completing a loop circuit extending over said subscriber line for transmission of battery current and voltage to said transmission circuit, said transmitter muting circuit comprising:

first switching means manually operated connecting said hold circuit to said loop circuit activating said hold circuit and seizing said subscriber line; and,

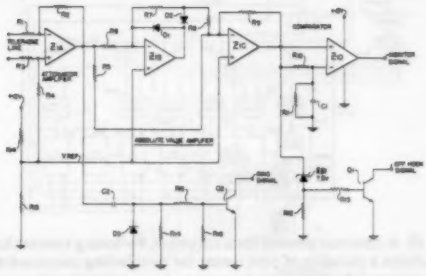
second switching means connecting a transmitter muting path across said handset transmitter in response to said first switching means, muting said handset transmitter.

4,451,707

RING DETECTOR AND TELEPHONE LINE MONITORING SYSTEM FOR TELEPHONE ANSWERING INSTRUMENT

Bradford E. Hanscom, Downey, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Continuation-in-part of Ser. No. 381,185, May 24, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 517,005
Int. Cl.³ H04M *1/64*
U.S. Cl. 179—84 R **12 Claims**



1. A monitoring system to be connected to a telephone line to control the operation of a telephone answering system, said telephone answering system being activated by ring signals received over the telephone line, and said monitoring system responding to the direct current voltage level of the telephone line, said monitoring system including in combination: an input attenuator amplifier circuit having a gain of less than unity for producing an output voltage which is a fraction of the line voltage of the telephone line; means connecting said input attenuator amplifier circuit to the telephone line; an absolute value amplifier circuit having a gain greater than unity connected to the output of said attenuator amplifier circuit for producing a single polarity output in response to outputs from said attenuator amplifier of positive or negative polarity; and an output circuit connected to the output of said absolute value amplifier for providing an output signal when the telephone line voltage drops below a particular value to prevent the telephone answering system from responding to spurious ring signals received over the telephone line during the continuance of said output signal.

4,451,708

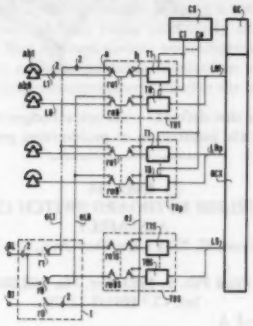
SPARE SUBSCRIBER TERMINAL APPARATUS

Marc Kemler; Christian Coppens, and Michel Billot, all of Velizy, France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Apr. 5, 1982, Ser. No. 365,851
Claims priority, application France, Apr. 3, 1981, 81 06811
Int. Cl.³ H04Q *1/20*
U.S. Cl. 179—98 **4 Claims**

1. Spare subscriber terminal apparatus for use in a telecommunications system, including: a plurality of subscriber lines; subscriber terminals for interfacing respective subscriber lines to the rest of the system; subscriber line test means provided with a subscriber line test bus; subscriber terminal test means provided with a junctor test bus; a test relay associated with

each subscriber terminal and having first switching means associated with each subscriber line to connect it selectively to its corresponding subscriber terminal or to said subscriber line test means, and second switching means associated with each subscriber terminal to connect it selectively to its corresponding subscriber line or said subscriber terminal test means; the subscriber terminals being organized in terminal units each of which comprises a plurality of subscriber terminals, and terminal units being organized in groups each of which comprises a plurality of terminal units; wherein the spare subscriber terminal apparatus comprises a spare terminal unit and a test means isolator per group, said isolator including third switching means for selectively connecting an extension of said sub-



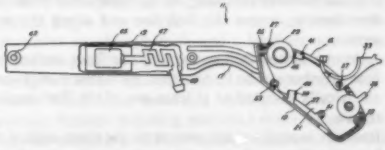
scriber line test bus having sufficient connections for parallel connection to all the subscriber lines of any one terminal unit either to said line test bus, and hence to said subscriber line test means, or else to the subscriber terminals of the spare terminal unit, whereby said extension of the subscriber line test bus may be switched to connect the spare terminal unit to the subscriber lines of a faulty terminal unit while isolating the subscriber line test bus from said extension of the line test bus, said test means isolator further including switching means to isolate said junctor test bus from an extension of the junctor test bus, said extension of said junctor test bus being connected to all the subscriber terminals of the terminal units, while said extension of the line test bus is being used to connect the spare terminal unit to subscriber lines.

4,451,709

EYE GLASS HEARING AIDS

Ronald Waxman, Highland Park, Ill., assignor to Beltone Electronics Corporation, Chicago, Ill.

Filed Dec. 21, 1981, Ser. No. 333,032
Int. Cl.³ G02C *11/06*
U.S. Cl. 179—107 S **9 Claims**



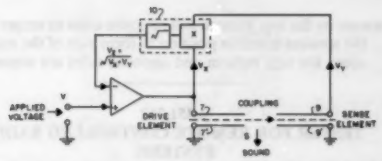
1. In an eye glass hearing aid having a paddle portion for placement behind the wearer's ear and for resting against the wearer's head, electrical circuitry housed within the paddle portion, an aperture positioned atop the paddle portion for providing a channel of communication to the electrical circuitry within the paddle portion, a control element positioned within the aperture and connected to the circuitry, said control element being controllable by the wearer in order to provide a controlling function with respect to the electrical circuitry, the improvement comprising a sweat guard positioned relative to the aperture for preventing moisture on the topside of the paddle from moving into the aperture during wearing of the hearing aid by the wearer, said sweat guard including a blocking member positioned adjacent at least a portion of the aperture, said blocking member providing a barrier raised above the topside of the paddle for blocking moisture on the topside of the paddle from running into the aperture.

4,451,710

PRECISELY STABILIZED PIEZOELECTRIC RECEIVER

Michael G. C. Taylor, Herentals, and Marc H. L. Buerman, Deurne, both of Belgium, assignors to GTE Atea NV, Herentals, Belgium

Filed Sep. 1, 1982, Ser. No. 413,928
Int. Cl.³ H04R *1/22*
U.S. Cl. 179—110 A **14 Claims**



1. In combination an electro-acoustic transducer comprising:
a vibratable diaphragm of a film polymer having piezoelectric properties;
a first pair of electrically conductive areas disposed on opposing overlapping surfaces of said film;
a second pair of electrically conductive areas disposed on opposing overlapping surfaces of said film, remote from said first pair of electrically conductive areas;
separate electrodes for each of said electrically conductive areas;
an amplifier including an inverting input, a non-inverting input and an output;
said amplifier output connected to said first pair of electrically conductive areas;
second means comprising an electronic network connecting said amplifier signal input to said electrodes of each said first and said second pair of electrically conductive areas and operated to output the square root of the product of the signals from said first and said second pair of electrically conductive areas with a polarity identical to that of the said signals;
said amplifier operated upon the application of an electrical signal at said non-inverting input to drive said first pair of electrically conductive areas to stimulate said diaphragm into a corresponding acoustic vibration; and
said second pair of electrically conductive areas operated to produce a corresponding electrical signal via said second means to control said amplifier output level.

4,451,711

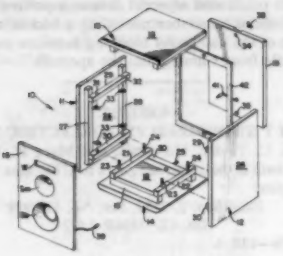
READILY PORTABLE SPEAKER ENCLOSURE

Mark Jackson, 144-10 106th Ave., Jamaica, N.Y. 11435

Filed May 7, 1981, Ser. No. 261,382
Int. Cl.³ A47B *87/00*
U.S. Cl. 179—146 E **8 Claims**

1. A readily portable speaker enclosure, comprising:
a plurality of walls having inner and outer surfaces and including a top, a bottom, opposite sides and a back;
a speaker board carrying at least one speaker;
clamping means on the top, bottom, opposite sides and back to readily releasably secure the top, bottom, opposite sides and back together, the clamping means includes reinforcing fastening strips disposed on the inner surfaces of the top, bottom and opposite sides, adjacent the edges thereof,

when the walls are assembled together, and quick-connect disconnect fastening means for fastening the reinforcing fastening strips to one another; and



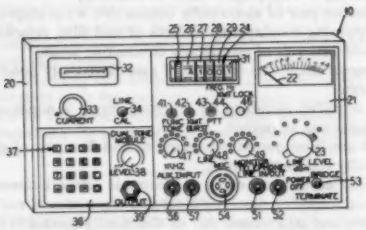
means on the top, bottom and opposite sides to securely hold the speaker board in position to form part of the enclosure when the top, bottom and opposite sides are separated.

4,451,712

TESTER FOR REMOTE CONTROLLED RADIO SYSTEMS

Richard F. Kovarik, Bridgeview, Ill., assignor to Industrial Electronics Service Co., Schaumburg, Ill.

Filed May 19, 1982, Ser. No. 380,000
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.3 R **10 Claims**



1. A remote systems tester comprising a guard tone generator, a function tone generator, means for adjusting the level of either the guard tone or the function tone such that when either level is set the amplitude relationship will be automatically established so that the function and second guard tones will be at lower levels than the initial guard tone, and means for sequentially connecting the outputs of said guard tone generator and said function tone generator to the communication lines to be tested.

4,451,713

PUSHBUTTON LOCK

James M. Wittes, 40 Palisade Rd., Lindea, N.J. 07036

Filed Feb. 4, 1981, Ser. No. 231,494
Int. Cl.³ H04M 1/66
U.S. Cl. 179—189 D **19 Claims**

1. A pushbutton locking device comprising a housing, gripping means in said housing drivable for gripping at least two opposite sides of at least one pushbutton in an array of side-by-side pushbuttons, each of which is actuatable by being pushed in a given direction, said housing being adapted to cover at least each pushbutton which is gripped, drive means having a driving element disposed above and overlying said gripping means and operable for driving said gripping means into engagement with said sides of said one pushbutton, and lock means for selectively locking said drive means to prevent disengagement of said gripping means from said pushbutton, said lock means being mounted substantially within the space

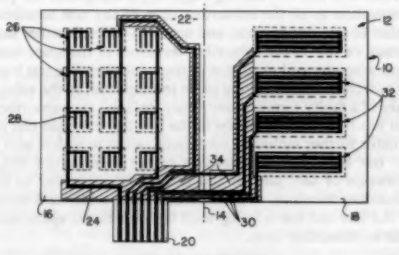
directly above that defined by the nearest edges of the pushbuttons adjacent the pushbutton or pushbuttons gripped.

4,451,714

SPACERLESS KEYBOARD SWITCH CIRCUIT ASSEMBLY

Franklin N. Eventoff, 2351 Lake View Ave., Los Angeles, Calif. 90039

Filed Feb. 9, 1983, Ser. No. 465,088
Int. Cl.³ H01H 13/70
U.S. Cl. 200—5 A **16 Claims**



1. A switch circuit assembly comprising:

a unitary base member having a front surface and having a fold line for dividing the base member into a first section and a second section;

a plurality of first conductor traces on the front surface of the base member extending along preselected paths on the first section;

a plurality of second conductor traces on the front surface of the base member extending along preselected paths on the first section, across the fold line and along the second section;

at least one first switch contact on the front surface of the base member on the first section, each first switch contact electrically coupled to at least one of the first conductor traces;

at least one second switch contact on the front surface of the base member on the second section, each second switch contact electrically coupled to at least one of the second traces, each first switch contact being located to face at least one of the second switch contacts when the base member is folded along the fold line;

an insulative layer applied over selected regions of the base member to cover selected regions of at least one of the first and second conductor traces to insulate the first conductor traces from the second conductor traces when the base member is folded with the first and second sections in touching relationship to each other;

each of the switch contacts on at least one of the first and second sections comprising;

a conductor ply, and

a pressure sensitive layer applied over the conductor ply, the pressure sensitive layer comprising a semiconducting material applied to be in intimate electrically conducting contact with the conductor ply, the pressure sensitive layer defining a first exposed surface with a multiplicity of microprotrusions of the semiconducting material extending therefrom for providing a multiplicity of surface contact locations, the other of the first and second contacts facing the first exposed surface defining at least one facing contact, the junction between the first exposed surface and its facing contact defining a surface junction, said surface junction being electrically non-conductive when the first exposed surface noncompressively touches the facing contact and being conductive when the first exposed surface compressively touches the facing contact.

4,451,715

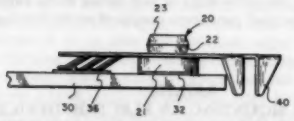
SWITCHING DEVICE FOR THICK/THIN FILM CIRCUITS

Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 3, 1982, Ser. No. 384,683

Int. Cl.³ H01H *19/54*

U.S. Cl. 200—11 G **6 Claims**



1. An electrical switching device arranged to connect a plurality of electrical film circuits together, said plurality of electrical film circuits deposited on an appropriate substrate and each including at least one contact pad, said switching device comprising:

a mounting element located adjacent to and equidistant from each contact pad, said mounting element including a pivot pin having a base section with a bottom surface fixedly mounted to said substrate and a head section extending from a top surface of said base section, said head section being wider at the midsection and tapering into a narrower width away from said midsection; and

a contact element including electrical contact means formed on the periphery of said contact element, said contact element including a centrally located orifice and a plurality of kerfs extending radially from said orifice, said orifice arranged to slip over said pivot pin head section with said kerfs allowing said orifice to expand fitting said contact element over said pivot and resting on said base section top surface allowing said contact element to be manually rotatable into at least a first position, whereby in said first position, said electrical contact means communicate with a different contact pad connecting at least two of said electrical circuits forming a first connected set.

4,451,716

ELASTIC-SPRING DRIVE FOR THE MOVABLE CONTACT OF AN ELECTRIC GROUNDING OR DISCONNECT SWITCH

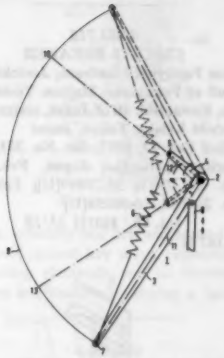
Dieter Lorenz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 26, 1982, Ser. No. 411,815

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136771

Int. Cl.³ H01H *21/42*

U.S. Cl. 200—67 A **1 Claim**



1. An elastic-spring drive for a movable contact of an electric switch comprising a drive shaft adapted to be coupled to the movable contact of the switch by at least one lever, a drive lever rigidly connected to the drive shaft, a cocking lever rotatably connected to the drive shaft, a spring flexibly connected at one end to the cocking lever at a first distance from the axis of the drive shaft and flexibly connected at the other end to the drive lever at a second distance from the axis of the drive shaft, said first distance being greater than said second distance, and an actuating lever coupled to the cocking lever to rotate the cocking lever upon movement of the actuating lever.

4,451,717

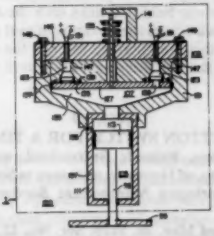
CIRCUIT INTERRUPTER OPERATING MECHANISM HAVING A CHEMICAL OPERATOR WITH STATIONARY COMBUSTION CHAMBERS

Ronald W. Crookston, Penn Township, Westmoreland County, and Ivan T. Burney, Plum, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 15, 1982, Ser. No. 339,604

Int. Cl.³ H01G *33/42*

U.S. Cl. 200—82 B **10 Claims**



1. An electric circuit interrupter, comprising:

(a) a pair of separable contacts;

(b) operating means operatively connected to the contacts for opening and closing the contacts;

(c) drive means for driving the operating means including a drive cylinder and a drive piston, said drive piston having a drive rod operatively connected to said operating means; and

(d) pressure generating means for generating an expulsion of gaseous medium into said drive cylinder, said pressure generating means including a housing having multiple stationary combustion chambers and directing means for selectively directing the expulsion of gaseous medium from any one of said multiple combustion chambers away from the remainder of said multiple combustion chambers and into said drive cylinder.

4,451,718

CIRCUIT BREAKER

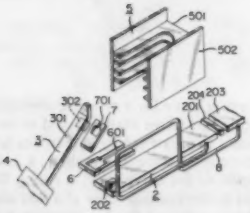
Shinji Yamagata; Fumiyuki Hisatsune; Junichi Terachi; Kiyomi Yamamoto, all of Fukuyama; Hajimu Yoshiyasu, Itami, and Yuichi Wada, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 351,314

Claims priority, application Japan, Feb. 27, 1981, 56-28897[U]; Feb. 27, 1981, 56-28899[U]; Feb. 27, 1981, 56-28903[U]; Mar. 2, 1981, 56-30058[U]

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—147 R **12 Claims**



1. A circuit breaker comprising:

a pair of contactors each having a conductor having a contact affixed thereto;

means for operating said contactors to open and close an electrical circuit therethrough;

arc shields having a resistivity greater than that of said conductors and mounted on each of said contactors and surrounding said contacts for suppressing the spread of an arc generated between said contacts when said contacts are separated to open the electrical circuit;

at least one of said contactors having an arc travel path therealong having a resistivity smaller than that of said arc shields and disposed at one end thereof in the vicinity of said contacts for leading the arc along said arc travel path away from said contacts; and

a magnetic driving means adjacent said contactors for generating a magnetic field that links with the magnetic field of the arc drawn across the contacts of said contactors when said contactors are operated to open the electrical circuit for driving the arc along said arc travel path.

4,451,719

PUSHBUTTON SWITCH FOR A TIMEPIECE

Rainer Lauterburg, Reinach, Switzerland, and Hans Geiger, Hasel, Fed. Rep. of Germany, assignors to Societe Suisee pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

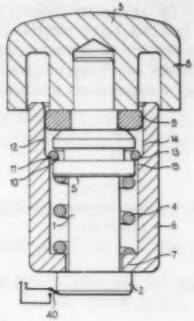
Filed Mar. 20, 1979, Ser. No. 22,233

Claims priority, application France, Mar. 24, 1978, 78 09966

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—159 R **4 Claims**

1. A finger pushbutton switch for an electronic timepiece such as a chronograph, comprising a stem means capable of an axial displacement relative to guide means fixed to the timepiece casing when urged by the finger of an operator against the force of a return spring, said axial displacement changing the state of electrical contact means, wherein elastic means is interposed between an element of said stem means and an element of said guide means and is axially retained within an opening provided in one of said elements, a contact surface for said elastic means being provided in the other of said elements for contacting said elastic means, and thereby changing its shape upon further axial movement of said stem means, said contact surface exhibiting an axial discontinuity or variation in form, relative to the relaxed shape of said elastic means, sufficient to effect a snap or toggle action in the relative displacement between the stem means and guide means whenever the elastic means traverses said discontinuity or variation on said contact surface in a first direction due to the urging of said operator to thereby change the state of said electrical contact means and in a second direction due to urging of said spring to thereby change the state of said electrical contact means; wherein said guide means comprises a tube fixed within the timepiece casing, and wherein said elastic means comprises an annular spring axially retained within the groove provided in the stem means, the outer edge of said spring being supported on a ramp in truncated cone form provided on the interior wall of said tube.



4,451,720

DEVICE FOR MOUNTING AN ELECTRIC DEVICE, IN PARTICULAR A CAM SWITCH ON A MOUNTING PLATE

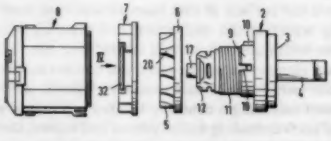
Bernd Ludwig, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,403

Claims priority, application European Pat. Off., Sep. 15, 1981, 81107259.4

Int. Cl.³ H01H *9/02*

U.S. Cl. 200—296 **6 Claims**



1. Device for mounting an electric apparatus, in particular a switch, on a mounting plate which is provided with a bore, comprising a coupling plate provided with a spring clip, said spring clip being displaceable either out of the coupling plate or into the coupling plate, said coupling plate being secured to a part of the apparatus facing the mounting plate; an insert housing insertable through said bore, said housing including

actuating means for controlling said apparatus, said actuating means having a connecting part inserted through the bore provided on its outside with notches; said spring clip when displaced into the coupling plate being engageable with said notches, and said housing being provided with a resilient retaining device connectable to the edge of the bore.

4,451,721

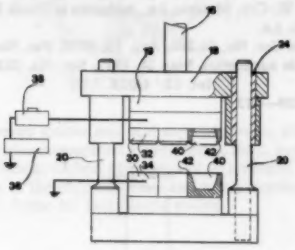
METHOD FOR HIGH FREQUENCY WELDING FLANGELESS THERMOPLASTIC SHELLS

Georg Nemeskeri, Chester, Canada, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 74,035, Sep. 10, 1979, abandoned. This application Jul. 26, 1982, Ser. No. 426,191

Int. Cl.³ H05B 6/54

U.S. Cl. 219—10.43 **6 Claims**



1. A method for welding together two substantially rigid thermoplastic subshells of the type having flanges with congruent proximal edges to form a flangeless thermoplastic shell, comprising:

applying clamping pressure to clamp the subshell flanges together between a pair of facing electrodes, the proximal edges of such flanges being aligned;

while continuing such clamping pressure, applying a dielectric field to the flanges, said field being most concentrated at the proximal edges, to soften and fuse said flanges together at or near the proximal edges, said continued clamping pressure producing further clamping movement whereby some softened flange material is displaced to form a bead inside the proximal edge location;

terminating application of the dielectric field; and

thereafter continuing such clamping movement of said electrodes to substantially sever the flanges from the flangeless shell at said proximal edges.

4,451,722

FUSING MACHINE

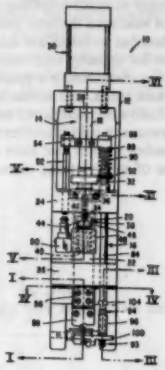
Charles F. Szantho, Roselle Park, and Edward D. Riordan, S. Somerville, both of N.J., assignors to Joyal Products, Inc., Linden, N.J.

Division of Ser. No. 203,446, Nov. 3, 1980, Pat. No. 4,371,772. This application Apr. 1, 1982, Ser. No. 364,218

Int. Cl.³ B23K 9/28

U.S. Cl. 219—86.25 **5 Claims**

1. A fusing machine, comprising a frame and a fusing electrode assembly mounted for reciprocating movement relative to said frame, said fusing electrode assembly including a fusing electrode shaft, said fusing electrode shaft having a first key way formed therein parallel to the direction of reciprocation of said fusing electrode assembly, and holding means attached to said fusing electrode shaft for releasably holding a fusing electrode, said holding means including a first holding member, said first holding member including a first key mating with said first key way to rigidly attach said fusing electrode shaft to said first holding member and a second key extending parallel to the direction of reciprocation of said fusing electrode assembly, and a second holding member, said second holding member including receiving means for releasably receiving said fusing electrode and a second key way mating with said second key to rigidly attach said first holding member to said second



holding member, whereby said first and second keys cooperate with said first and second key ways, respectively, to rigidly support said fusing electrode and to thereby facilitate its proper alignment and positioning during a fusing operation.

4,451,723

ARC-WELDING DEVICE USED TO SECURE STUDS ON METALLIC ELEMENTS UNDERWATER

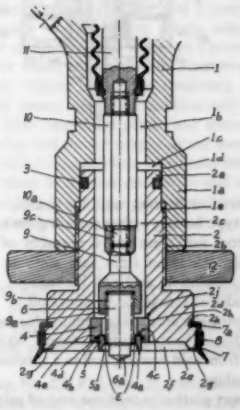
Jean-Pierre Gres, Aix-en-Provence, and Jean-Pierre G. Icard, Marseille, both of France, assignors to Societe Anonyme dite: Compagnie Maritime d'Expertises S.A., France

Filed May 26, 1982, Ser. No. 382,096

Claims priority, application France, May 26, 1981, 81 10677

Int. Cl.³ B23K 9/20

U.S. Cl. 219—98 **3 Claims**



1. Arc-welding device to attach a stud to a metallic element immersed in a liquid, comprising a head including means forming a substantially cylindrical chamber surrounding a fusion area where said stud contacts said metallic element, a stud carrier concentrically arranged in said chamber, a dielectric refactory ring arranged around one end of said stud and retained in said chamber by a ferrule holder, flexible skirt means affixed to said head at one circular edge and arranged around the periphery of said chamber, the other circular edge of said flexible skirt means tapering to a thin peripheral rim, said

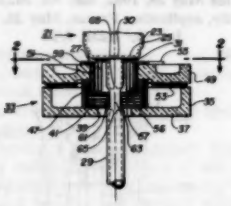
flexible skirt means being formed to flare outwardly to said other circular edge to a diameter greater than a diameter at said one circular edge forming a truncated cone that diverges from a base of said chamber, said thin peripheral rim being adapted to sealingly contact a surface of said metallic element for attachment of said stud thereto, means in fluid communication with said chamber to insufflate said chamber for expelling all liquid therein by causing said thin peripheral rim of said skirt to lift and for maintaining a gaseous environment favorable to welding said studs, and means for forming a depression in said chamber following said liquid being expelled therefrom, whereby the pressure in said chamber is less than the pressure outside said chamber so that said skirt is maintained in contact with said surface of said metallic element.

4,451,724
Patent Not Issued For This Number

4,451,725
ELECTRICAL HEATING UNIT FOR SEALING VACUUM ELECTRON TUBES

James Mount, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,620
Int. Cl.³ F27B 5/14; F27D 11/02
U.S. Cl. 219—390 **4 Claims**



1. An electrical heating unit for sealing vacuum electron tubes of the type having a glass stem, a glass exhaust tubulation extending from said stem and a plurality of electrically-conducting leads extending from said stem in a circular array around said tubulation, said unit including

(a) a cylindrical resistance heating coil,

(b) an electrically-insulating support for said coil,

(c) cylindrical heat-shielding means located within and spaced from said heating coil in a substantially concentric relationship,

(d) a support plate adjacent one end of said coil and having an aperture therein permitting said leads to be positioned within said heat-shielding means,

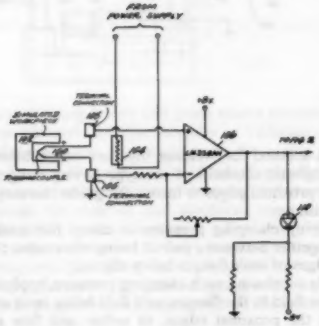
(e) and means for securing elements (a) through (d) together as a unit.

characterized in that said heat-shielding means comprises a unitary member of heat-conducting material including (i) a hollow cylindrical body adapted to receive said leads therein, (ii) an outwardly-extending flange at one end of said body and (iii) an inwardly-extending flange at the other end of said body, said outwardly-extending flange having an outer size that is larger than said support plate aperture, said inwardly-extending flange having an inner size that is smaller than the diameter of said circular array of leads and larger than the diameter of said tubulation, and said body has a height that is less than the length of the longest of said leads.

4,451,726
KILN TEMPERATURE CONTROL DEVICE

Frank H. Anthony, 1709 N. Hullen, Metarie, La. 70001, and Vernon W. Coy, Metarie, La., assignors to Frank H. Anthony, Metarie, La.

Division of Ser. No. 66,296, Aug. 13, 1979, Pat. No. 4,367,399.
This application May 24, 1982, Ser. No. 381,371
Int. Cl.³ G01K 7/04
U.S. Cl. 219—413 **1 Claim**



1. A kiln temperature controller for controlling the temperature of a kiln while firing ceramic ware having predetermined wall thickness, said controller comprising:

a temperature sensor housed within ceramic material having a wall thickness approximately equal to one-half the expected wall thickness of ceramic ware to be fired in the kiln so as to approximately sense the internal temperature of the ceramic ware being fired in said kiln, and

kiln heating means connected to be controlled by said temperature sensor.

4,451,727
HEATING FIXTURE

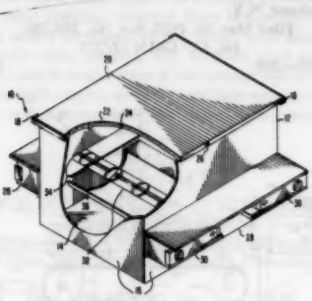
Donald P. Marinelli, Hamilton Square, and Ivan Ladany, Stockton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,154
Int. Cl.³ H05B 3/68
U.S. Cl. 219—464 **3 Claims**

1. In a heating fixture comprising an energy source,

support means disposed to absorb energy from said energy source for heating said support means and a workpiece thereon, and

an enclosed support frame including mounting means for



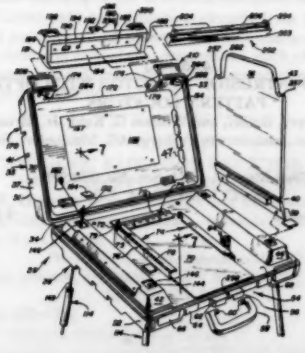
said energy source and said support means; wherein the improvement comprises a non-porous, ridid, heat conductive, vitreous carbon plate ground to a desired degree of flatness as the support means and being mounted on said support frame for said energy source.

4,451,728

SELF-CONTAINED PORTABLE VOTING BOOTH APPARATUS

Richard H. McKay, Chicago, and Geoffrey R. Ryan, Glen Ellyn, both of Ill., assignors to Frank Thornber Co., Chicago, Ill.

Filed Feb. 1, 1982, Ser. No. 344,628
Int. Cl.³ G07C *13/00*
U.S. Cl. 235—50 R **49 Claims**



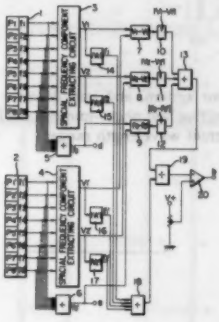
1. A self-contained portable voting booth apparatus which can be used for paper and vote recording device balloting and can be readily set up at any desired voting site, comprising a carrying case having a pair of hinged top and bottom case sections, the improvement wherein said bottom case section is provided with surface means for supporting a paper ballot, including securing means mounted on said surface means for pivotally securing a vote recording device, whereby said securing means is pivotable to a non-use position whenever said apparatus is used for paper balloting.

4,451,729

AUTOMATIC FOCUSING DEVICE AND LENS MOTOR CONTROL

Tadao Takagi, Yokohama, and Nobuo Okabe, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,804
Claims priority, application Japan, Jul. 28, 1981, 56-117089
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **11 Claims**



1. A device for automatically focusing an objective lens, comprising:

(a) detecting means capable of detecting the positional relation of said objective lens with respect to an in-focus position at which an image of an object is formed on a predetermined focal plane;

(b) means including an electric motor for moving said objective lens toward said in-focus position; and

(c) control means for controlling the driving of said motor in response to said detecting means, said control means including a power supply circuit means adapted, when operative, for connecting said motor to a power source, a braking circuit means adapted, when operative, for short-circuiting said motor, means for rendering said power supply circuit means operative continuously when said image is far from said focal plane, and means for alternately rendering said power supply circuit means and said braking circuit means operative when said image is close to said focal plane to thereby decelerate said motor when said objective lens is within a predetermined range near said in-focus position.

4,451,730

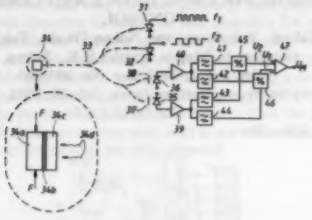
OPTICAL MEASURING APPARATUS FOR MEASURING FORCE OR PRESSURE

Torgny Brogardh; Olof Engström, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 226,829, Jan. 21, 1981, abandoned. This application May 9, 1983, Ser. No. 492,651
Claims priority, application Sweden, Jan. 24, 1980, 8000558
Int. Cl.³ G01D *5/26*
U.S. Cl. 250—227 **34 Claims**

1. An optical measuring apparatus for measuring a force, comprising at least one light source, an optical fiber system comprising at least one optical fiber for conducting at least one frequency of light from and to a sensing means, and a detector system, wherein said sensing means comprises a material having force-dependent photo-luminescent properties, such that a wavelength shift of the entire spectrum of the emitted photo-luminescent light from said sensing means is produced within

at least two different wavelength ranges as a function of the force applied to said sensing means, said optical fiber system directing said photo-luminescent light from said sensing means



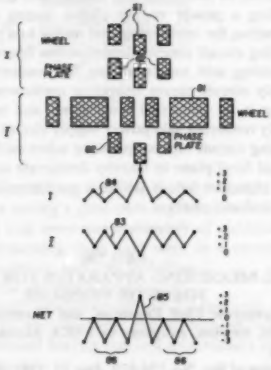
to said detector system, and said detector system including means for detecting said photo-luminescent light within said at least two different wavelength ranges.

4,451,731

APPARATUS AND METHOD FOR MODULATING LIGHT TO GENERATE AN INDEX PULSE

Mark Leonard, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 10, 1981, Ser. No. 291,666
Int. Cl.³ G01D *5/38*
U.S. Cl. 250—237 SE **9 Claims**



1. An apparatus for modulating light comprising:

a first track having a first select pattern of alternating non-transmissive and nonuniformly aligned transmissive sections for modulating light;

a second track having a second select pattern of alternating and non-transmissive and nonuniformly aligned transmissive sections for modulating light transmitted by said first track, said second select pattern nonprogressively becoming substantially coincident with a portion of said first select pattern when said tracks move past each other; and

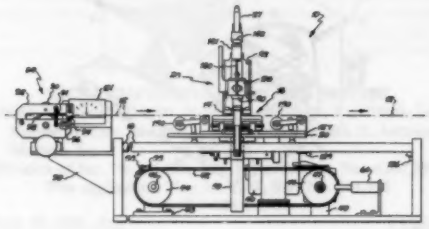
means for causing said tracks to move past each other.

4,451,732

APPARATUS FOR MEASURING THICKNESS OF COATING ON CONTINUOUSLY MOVING MATERIAL

Jerry J. Spongr, Tonawanda, and Byron E. Sawyer, N. Tonawanda, both of N.Y., assignors to Twin City International, Inc., Amherst, N.Y.

Filed May 20, 1982, Ser. No. 380,250
Int. Cl.³ G01N *23/225*
U.S. Cl. 250—308 **12 Claims**



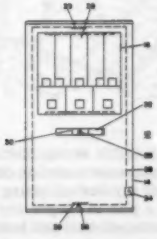
1. In an apparatus for measuring coating thickness on strip material moving along a predetermined path, the apparatus including a shuttle carrying a measuring probe having coating thickness sensing means and carrying a supporting surface for supporting the strip material during the time the thickness measurement is being made, drive means for reciprocating the shuttle along a preselected segment of the path traveled by the strip material, means for selectively engaging and disengaging the supporting surface and the moving strip so that the shuttle is driven by the strip for synchronous movement therewith during engagement thereof and is driven independently of the strip during disengagement thereof, and means for operatively coupling and uncoupling the probe and the moving strip while the shuttle and the strip are engaged, the improvement comprising said supporting surface positioned for angular inclination relative to the plane in which the major transverse surface of said strip lies and about an axis substantially parallel to the longitudinal axis of the strip, and means for selectively inclining said surface a predetermined amount while said strip is in driving contact with said supporting surface to properly position for measurement that portion of the coated area desired to be measured.

4,451,733

INFRARED INTRUSION DETECTOR WITH OPTICAL PATTERN LOCATORS

Ronald G. Avery, Bethel, and William G. Kahl, Jr., Brookfield, both of Conn., assignors to Cerberus AG, Mannedorf, Switzerland

Filed May 17, 1982, Ser. No. 378,995
Int. Cl.³ G01J *5/04, 5/08*
U.S. Cl. 250—342 **9 Claims**



1. In a passive infrared intrusion detector wherein an infra-

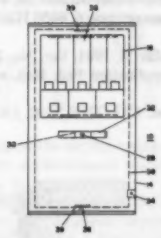
red detecting element and a light source are enclosed within an enclosure having an aperture formed in one wall, said one wall comprising a removeable cover, and wherein a lens unit is provided in said aperture, the improvement wherein said removeable cover is mountable in a closed position and in a partially open position, wherein there is provided a tamper switch to detect movement of said cover from said closed to said partially open position, and wherein there is provided means responsive to operation of said tamper switch for illuminating said light source, whereby said light source can be used to orient said detector with the cover in the partially open position.

4,451,734

INFRARED INTRUSION SENSOR WITH SELECTABLE RADIATION PATTERNS

Herbert N. St. Jean, New Milford, and Richard Settanni, Bethel, both of Conn., assignors to Cerberus AG, Mannedorf, Switzerland

Filed May 17, 1982, Ser. No. 379,139
Int. Cl.³ G01J 5/08
U.S. Cl. 250—342 **3 Claims**



1. In a passive infrared intrusion detector wherein an infrared detecting element is enclosed within an enclosure having an aperture formed in one wall of said enclosure, and wherein a lens unit is provided in said aperture, the improvement wherein said aperture is provided on one half of said wall, wherein said lens unit includes first and second lens portions, each corresponding in size to said aperture, and each for focusing radiation onto said detecting element from different patterns of sensitivity, and wherein said lens unit is mountable to said enclosure in at least two orientations, each of said orientations causing a different one of said lens portions to be positioned in said aperture.

4,451,735

CRYOGENIC RADIATION DETECTOR WITH HIGH-DENSITY CONDUCTOR ARRAY

Heinz K. Diedrich; Giovanni Greco, and Domenico Fanti, all of Rome, Italy, assignors to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed Feb. 8, 1982, Ser. No. 347,035
Claims priority, application Italy, Feb. 9, 1981, 47753 A/81
Int. Cl.³ G01J 5/02
U.S. Cl. 250—352 **11 Claims**

1. A radiation detector comprising:

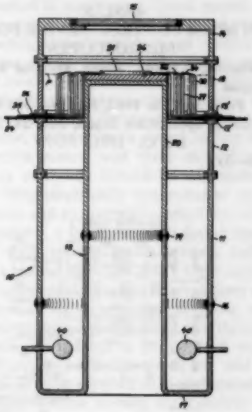
an evacuated container with an external boundary partly constituted by two axially aligned generally cylindrical metallic peripheral wall sections;

a cooled metallic cylinder extending axially within said wall sections and defining therewith an annular space, said cylinder having a closed end disposed in a transverse plane;

photoelectric transducer means including a multiplicity of radiation-sensing elements disposed on said closed end in a central area of said container and confronted by a radiation-transparent window thereof parallel to said transverse plane;

a stack of annular ceramic layers surrounding said cylinder at a location axially offset from said transverse plane, said stack being sintered into a solid body which forms part of a hermetic seal joining said wall sections to each other;

a multiplicity of thin conductor strips radially arrayed on a surface of at least one of said layers extending inward from said wall sections toward said cylinder, each conductor strip being partly overlain by an adjoining layer of said stack leaving an inner and an outer end of the strip exposed; and



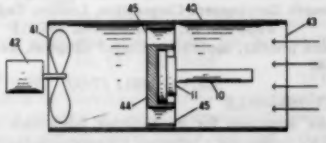
a multiplicity of metallic leads in said space galvanically connecting the exposed inner ends of said conductor strips to respective radiation-sensing elements of said transducer means, each of said leads including a metal pin extending axially from the inner end of the respective strip to substantially said transverse plane and further including a radially oriented wire substantially thinner than said pin extending from a tip of said pin to a respective radiation-sensing element across a narrow annular gap separating the pins of said leads from said cylinder, said wire normally having a curvature sufficient to enable its contraction at cryogenic temperatures.

4,451,736

METHOD AND APPARATUS FOR MEASURING AIR ION CONCENTRATIONS

John R. Cameron, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 16, 1982, Ser. No. 369,006
Int. Cl.³ G01T 1/18
U.S. Cl. 250—376 **14 Claims**



1. A method of determining the relative concentration of ions in air, comprising the steps of:

(a) providing an electret formed of a dielectric material which can carry charge;

(b) charging the electret to a selected charge level;

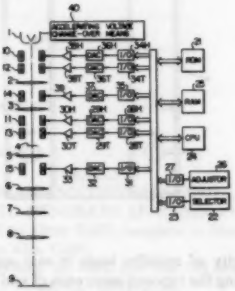
(c) covering the charged electret with an enclosure so that the electret is shielded from ambient atmosphere;
(d) exposing the electret to ambient atmosphere for a selected period of time by removing the enclosure, and thereafter covering the electret with the enclosure again;
(e) removing the enclosure, and, immediately thereafter,
(f) measuring the charge remaining on the electret, the difference between the initial charge and the measured charge being related to the quantity of ions collected by the electret during exposure.

4,451,737

ELECTRON BEAM CONTROL DEVICE FOR ELECTRON MICROSCOPES

Shigeto Isakozawa, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,917
Claims priority, application Japan, Jun. 24, 1981, 56-96509
Int. Cl.³ H01J 37/26
U.S. Cl. 250—311 11 Claims



1. An electron beam control device for an electron microscope, comprising:
deflection means for deflecting an electron beam;
storage means for storing therein digital signals corresponding to observation modes for deflecting said electron beam;
means for specifying one of said observation modes and for reading one of said digital signals corresponding to the specified observation mode out of said storage means;
means for converting the read-out digital signal into an analog signal; and
means for controlling said deflection means on the basis of said analog signal.

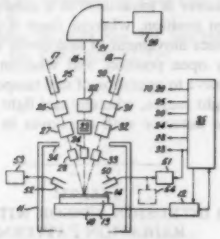
4,451,738

MICROCIRCUIT FABRICATION

Kenneth C. A. Smith, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed Jul. 24, 1981, Ser. No. 286,715
Claims priority, application United Kingdom, Jul. 28, 1980, 8024640
Int. Cl.³ H01J 37/00
U.S. Cl. 250—492.2 16 Claims

1. An apparatus for microcircuit fabrication comprising means for presenting a substrate for exposure during an exposure interval, means for producing independently of each other at least one ion beam and at least one electron beam, the axes of the beams being relatively inclined for substantial convergence at the substrate, means for focusing each ion beam on the surface of the substrate at a higher resolution, means for focusing each electron beam on the surface of the substrate at a lower resolution and means for scanning simultaneously said electron and ion beam across the surface to produce during the



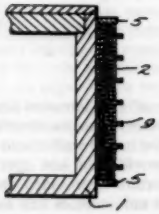
exposure interval a respective portion of a desired exposure pattern.

4,451,739

CONTAINER FOR RADIOACTIVE MATERIALS

Richard Christ, August-Bebel-Strasse 20, 6454 Bruchköbel, and Hartmut Kroll, Gaussstrasse 6, 6450 Hanau, both of Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,379
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008992
Int. Cl.³ G21F 5/00, 3/00
U.S. Cl. 250—506.1 7 Claims



1. A container for radioactive material having an interior for receiving radioactive material and an exterior surface, at least part of said exterior surface having gamma ray absorbing means removably mounted thereon to a depth sufficient to absorb gamma radiation from the radioactive material disposed within said container, said gamma ray absorbing means comprising wire means wrapped around the exterior surface of said container with a plurality of wraps, and said container also being provided with cooling flanges which are at least partially embedded in said wire means.

4,451,740

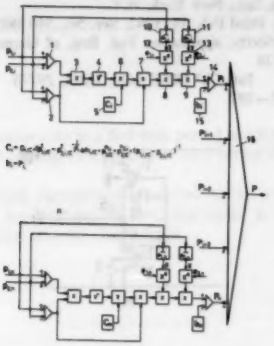
DEVICE FOR DETERMINING THE POWER OUTPUT OF A TURBO-GROUP DURING DISTURBANCES IN THE ELECTRICITY SUPPLY NETWORK

Karel Skala, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 12, 1982, Ser. No. 397,206
Claims priority, application Switzerland, Jul. 13, 1981, 4565/81
Int. Cl.³ F01K 13/02
U.S. Cl. 290—40 C 3 Claims

1. Device for determining the power output of a turbo-group during disturbances in the electricity supply network, the turbo-group being subdivided into n turbine-sections, a pressure-measuring point for the working-medium pressure being provided, in each case, at the beginning and the end of each

turbine-section, in general for monitoring operation, the turbo-group also possessing an automatic control unit (25) and control elements (26), for regulating the power output during normal, undisturbed operation, and featuring a switch-over relay (24), which can be actuated by a signal which is triggered by the disturbance, this relay being designed to activate the device (18) when a disturbance occurs, the turbo-group also featuring pressure-signal lines (19,20,21), which are designed to be pressurized from the above-mentioned pressure-measuring points thereon, while the device (18) features n groups of computing elements, each of which is individually assigned to one of the n turbine-sections, the computer elements (1–16,



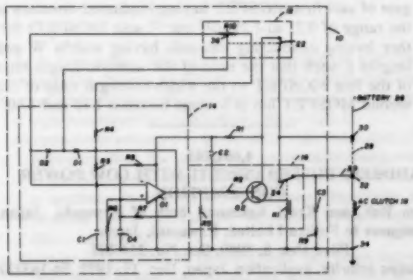
28–36) of each group in the device being structured in a manner such that, when a disturbance occurs, they process the pressures ($p_{1,i}$, $p_{2,i}$, $p_{1,i+1}$, $p_{2,i+1}$, . . . $p_{1,n}$, $p_{2,n}$)which are supplied by the pressure-signal lines (19, 20, 21), as input variables, to generate an output signal representing the instantaneous power output $P_i(t)$ of a turbine-section (i), in which device an adder (16;36) is provided, which combines the $P_i(t)$ output signals to generate a resulting output signal representing the instantaneous total power output P(t) of the turbo-group, this signal being intended to be supplied to the automatic control unit (25) of the turbo-group (17), in order to sustain the regulating function throughout the duration of the event producing the disturbance.

4,451,741

ELECTRONIC CONTROL FOR AN AUTOMOBILE AIR CONDITIONER

George H. Brower, 1628 English Pl., Crofton, Md. 21114

Filed Nov. 8, 1982, Ser. No. 439,761
Int. Cl.³ H01N *43/06*
U.S. Cl. 307—10 R **7 Claims**



1. An electronic control for an air conditioner, comprising:

an adjustable range control means, said adjustable range control means being a potentiometer, said potentiometer having a range of operation, said adjustable range control means having a knob-like switch means therewith, said knob-like switch means serving as a main switch for turning on said electronic control for an air conditioner, said knob-like switch means further being connected to and serving as a means of adjusting said potentiometer through its said range of operation, said knob-like switch means being capable of remaining in an "on" contact mode while serving as said means of adjusting said potentiometer through its said range of operation;

an interval timer means, said interval timer means being electrically connected to said adjustable control means;

a relay driver means, said relay driver means being electrically connected to said interval timer means;

an electrical wiring circuit, said electrical wiring circuit interconnecting said adjustable range control means, said interval timer means, and said relay driver means;

an enclosure means, said enclosure means housing and enclosing said adjustable range control means, said interval timer means, said relay driver means, and said electrical wiring circuit, said enclosure means having three electrical connection means, said three electrical connection means being externally located on said enclosure means and each being electrically connected to said electrical wiring circuit, and an operational amplifier, a first resistor, a second resistor, a third resistor, a fourth resistor, a fifth resistor, a sixth resistor, and a seventh resistor, a first capacitor, a second capacitor, and a third capacitor, a first diode, and a second diode, said interval timer means being centered around said operational amplifier, said interval timer means having power supplied to it through said first resistor, said first resistor in conjunction with said first capacitor forming a filter network for said operational amplifier as power is supplied to it, said operational amplifier operating as a free running multivibrator with a constant frequency determined by said second capacitor and said second resistor, said interval timer functioning as a low frequency pulse generator, a variable pulse width being determined by said potentiometer and said first and second diodes, said operational amplifier having an output voltage held to a high state due to feedback of positive voltage through said third resistor and a resistor divider network formed by said fourth and fifth resistors, said third, fourth and fifth resistors being connected to the non-inverting input side of said operational amplifier, said third capacitor serving as a filter to noise spikes and to stabilize a high gain of the circuit of said operational amplifier, said sixth resistor being connected in series with said potentiometer for discharge of said second capacitor when reaching a full charge, said seventh resistor providing a fixed load for said operational amplifier.

4,451,742

POWER SUPPLY CONTROL FOR INTEGRATED CIRCUIT

Cecil J. Aswell, Coppell, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US81/00705, 371 Date May 27, 1981, 102(e) Date May 27, 1981, PCT Pub. No. WO80/02644, PCT Pub. Date Dec. 11, 1980
Continuation of Ser. No. 282,179, May 27, 1981, abandoned.
This PCT application May 27, 1981, Ser. No. 560,253
Int. Cl.³ H02J *9/06*
U.S. Cl. 307—66 **15 Claims**

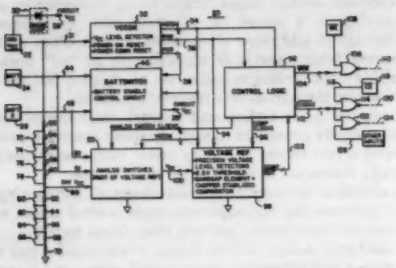
1. A method for providing power to an integrated circuit from one of a plurality of sources, comprising the steps of:

providing a primary power source and first and second backup power sources;

comparing the voltages of said first and said second backup power sources to select the backup power source having the higher voltage;

connecting the one of said backup power sources having the higher voltage to supply power to said integrated circuit

when the voltage of said primary power source is less than a first predetermined voltage; and



disabling input signals to said integrated circuit when the voltage of the power source connected thereto is less than a second predetermined voltage.

4,451,743

DC-TO-DC VOLTAGE CONVERTER

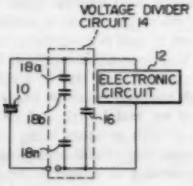
Fuminori Suzuki, and Singo Ichikawa, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 328,990

Claims priority, application Japan, Dec. 29, 1980, 55-186857; Dec. 29, 1980, 55-186858; Dec. 29, 1980, 55-186859; Jan. 23, 1981, 56-9180; Jan. 23, 1981, 56-9181

Int. Cl.³ H02M *3/18*

U.S. Cl. 307—110 **10 Claims**



6. A DC-to-DC converter circuit for converting the voltage of a battery for thereby producing a power supply voltage to be applied to a load, comprising:

a main capacitor, said main capacitor being fixedly connected in parallel with said load;

a set of n auxiliary capacitors each having a value of capacitance equal to that of said main capacitor wherein "n" is an integer;

a source of switching signals provided by said load; and a plurality of electronic switch means responsive to said switching signals for controlling the interconnection conditions between said main capacitor, said auxiliary capacitors, said load and said battery such as to repetitively and alternately establish a first operating condition in which said n auxiliary capacitors are connected in parallel with one another and are connected in series with said main capacitor and a second operating condition in which said n auxiliary capacitors are connected in series with one another and are collectively connected in parallel with said main capacitor, to thereby establish a value of said power supply voltage which is substantially equal to said battery voltage multiplied by a factor which is a function of n, during said first operating condition said auxiliary capacitors being connected in parallel with one another and being connected as a group in series with said main capacitor across said battery to be charged therefrom, and during said second operating condition, said auxiliary capacitors being disconnected from said battery and being connected in series with one another and connected as a series-connected group in parallel with said main capacitor, to thereby establish a value of said supply voltage which is substantially equal to said battery voltage multiplied by a factor $n/(n-1)$.

4,451,744

MONOLITHIC INTEGRATED REFERENCE VOLTAGE SOURCE

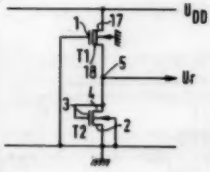
Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,888

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108726

Int. Cl.³ G05F *3/16*; H01L *29/78*

U.S. Cl. 307—297 **1 Claim**



1. A monolithic integrated reference voltage source, comprising:

a substrate;

a first depletion-type MOSFET formed in said substrate and having drain, source and gate electrodes, said drain electrode adapted to be connected to a supply potential, and the gate electrode adapted to be connected to a reference potential;

a second enhancement-type MOSFET formed in said substrate and having drain, source and gate electrodes, said drain electrode being connected to the source electrode of the first MOSFET, the gate electrode being connected to the drain electrode of the second MOSFET, and the source electrode being connected to the reference potential; and

a reference voltage output connected to the connection between the source and drain electrodes of said first and second MOSFETs, said MOSFETs having a gate oxide layer with a thickness lying in the range of between 0.060 and 0.066 microns, said substrate having a doping level below the gate of said second MOSFET within the range of 5 to $7 \cdot 10^{14}$ cm^{-3}, and the substrate surface below the gate of said first MOSFET having implanted donators in the range of 0.75 to $1.25 \cdot 10^{12}$ cm^{-2}, said MOSFETs further having conducting channels having widths W and lengths L such that the ratio of the width-to-length ratio of the first MOSFET to the width-to-length ratio of the second MOSFET lies in a range between 1.10 and 1.40.

4,451,745

ADDRESS BUFFER CIRCUIT WITH LOW POWER CONSUMPTION

Hideo Itoh, and Kenji Agatsuma, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 8, 1980, Ser. No. 214,205

Claims priority, application Japan, Dec. 19, 1979, 54-165232

Int. Cl.³ H03K *19/092, 17/687*

U.S. Cl. 307—475 **4 Claims**

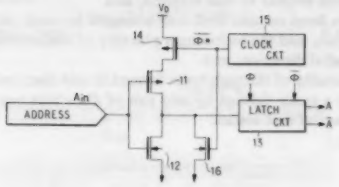
1. An address buffer circuit including:

an inverter having an input for receiving an address signal, an output for providing an inversion signal being the

inverted received address signal and a power source terminal for receiving power from a power source;

a transistor connected in series between the power source terminal of the power source and having a gate electrode;

a clock circuit, operatively connected to the gate electrode, for generating a first internal clock signal for turning ON



the transistor only in a first time period and for generating a second internal clock signal at least during the first time period;

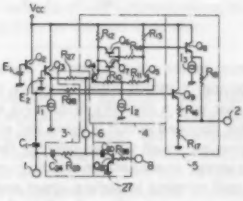
a latch circuit operatively connected to the output of the inverter for latching the inversion signal in response to said second internal clock signal.

4,451,746

NON-LINEAR EMPHASIS CIRCUIT

Koichi Hirose, Katsuta, and Kazuo Kondo, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,811
Claims priority, application Japan, Jul. 4, 1980, 55-90528
Int. Cl.³ H03B *1/04*; G06G *7/12*
U.S. Cl. 307—494 **11 Claims**



1. A non-linear emphasis circuit capable of effecting an emphasis the degree of which is variable depending on the level of an input signal to the emphasis circuit, comprising:

a high-pass filter for receiving an input signal;

a compressor arranged to be supplied with the output of said high-pass filter, the gain of said compressor being variable responsive to the output of said high-pass filter and having a tendency to decrease and increase responsive to an increase and a decrease of the output of said high-pass filter, respectively;

an adder arranged to be supplied with said input signal and the output of said compressor and having means for adding them at a predetermined rate for producing an emphasized output signal; and

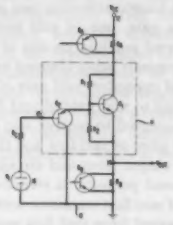
a switching circuit in electrical connection with said high-pass filter for disabling the latter.

4,451,747

HIGH SPEED CLAMP CIRCUIT

Lucien M. Rucker, III, Arlington, Tex., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 8, 1982, Ser. No. 337,989
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—549 **8 Claims**



1. A circuit in which the magnitude of the voltage at an output terminal does not exceed a particular value related to a reference voltage comprising

(1) first and second transistors of opposite polarity having the base of the first transistor connected to the emitter of the second transistor;

(2) a first resistance means connected between the collector and base of the first transistor and a second resistance means connected between the emitter and base of the first transistor;

(3) a first voltage level terminal connected to the collector of the first transistor;

(4) a voltage output terminal connected to the emitter of the first transistor;

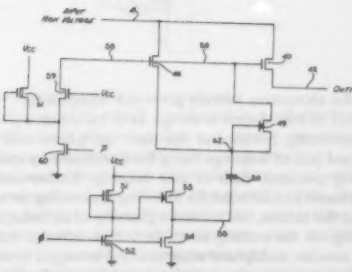
(5) a reference voltage terminal connected to the base of the second transistor.

4,451,748

MOS HIGH VOLTAGE SWITCHING CIRCUIT

Daniel Amrany, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 15, 1982, Ser. No. 339,790
Int. Cl.³ H03K *17/10, 17/687*
U.S. Cl. 307—578 **12 Claims**



1. In an integrated circuit employing a first potential and a higher second potential, a circuit for switching said second potential with a control signal which is lower in potential than said second potential, comprising:

a capacitor;

charging and discharging means coupled to one terminal of said capacitor, for charging and discharging said capacitor, said charging and discharging means being coupled to, and powered exclusively from, said first potential;

a first field-effect transistor having two current-conducting

terminals and a gate, one of said terminals coupled to receive said second potential;

a second field-effect transistor having two current-conducting terminals and a gate, one of said terminals coupled to said gate of said first transistor, and the other of said terminals of said second transistor coupled to the other of said terminals of said capacitor, and the gate coupled to effect a self-bias operation;

a third field-effect transistor having two current-conducting terminals and a gate, one of said terminals coupled to receive said second potential on one of said terminals, the other of said terminals being coupled to said other of said terminals of said capacitor, said gate of said third transistor being coupled to said gate of said first transistor; and

switching means coupled to receive said control signal and coupled to said gates of said first and third transistors, for controlling the output from said circuit,

whereby said second potential is switched at the other of said terminals of said first transistor with said circuit being exclusively powered from said first potential.

4,451,749

AC GENERATOR

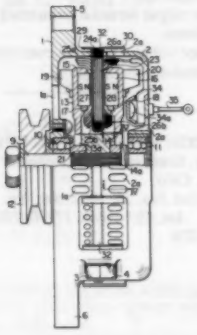
Kenji Kanayama, Kariya; Hidekuni Sugi, Nagoya; Shuzo Kinkori, Okazaki, and Kouzi Kawasumi, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 25, 1982, Ser. No. 411,361

Claims priority, application Japan, Sep. 11, 1981, 56-144436; Nov. 13, 1981, 56-182745

Int. Cl.³ H02K 9/06

U.S. Cl. 310—62 **20 Claims**



1. An alternating current generator comprising:

a pair of cup-shaped housings, each including a plurality of mounting portions at the outer peripheral side thereof, said pair of housings being fixed mutually by said mounting portions, each of said housings further including a plurality of air holes for allowing the cooling air to flow in at the bottom thereof and a plurality of air holes for blowing out the cooling air at the peripheral edge thereof;

an annular multiphase armature coil arranged in said housings and including annular and substantially flat portions at the ends thereof, said multiphase armature coil including a plurality of winding portions arranged equidistantly along the periphery thereof the winding portion for a given phase including an outer peripheral part extending straight outward radially, said outer peripheral part extending straight being held by the inner ends of said housings, the winding portions for the other phases including outer peripheral parts bent in a direction substantially perpendicular to the plane containing said flat annular portions outside thereof;

a shaft supported rotatably by said housings;

a pair of discs of magnetic material fixed on said shaft and arranged on the both sides of said armature coil;

a plurality of magnets fixed on said discs and arranged equidistantly along the periphery of each of said discs in opposed relation to said flat annular portion of said armature coil;

a pair of fans fixed on said discs on the other side thereof with respect to said magnets; and

a fan fixed on said shaft and arranged between said pair of discs, said fan including a plurality of blades extending in radial direction; and

a plurality of through holes formed in said discs and opened to a space defined by said pair of discs between adjacent ones of said blades.

4,451,750

PROTECTIVE ARRANGEMENT FOR A PLUG-CONNECTED ELECTRIC MOTOR SEALED AGAINST PRESSURE, VAPORS AND RADIATION

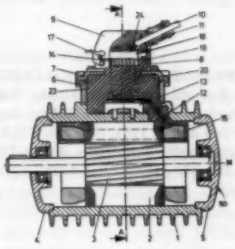
Dieter Heuer, Wenden, and Georg Schmiedke, Friedberg, both of Fed. Rep. of Germany, assignors to Elektro-Mechanik GmbH, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,042

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 8102601[U]

Int. Cl.³ H02K 5/10

U.S. Cl. 310—88 **5 Claims**



1. An electric motor construction for nuclear plants, comprising: a housing; a motor rotor rotatably mounted in said housing; a stator with a plurality of grooves and stator windings, said stator disposed in said housing and around said rotor; said housing having a wall with an opening therein; a terminal box plug connected to said stator windings mounted on said wall around said opening including upper and lower interengageable connector parts with a plurality of cables extending through said upper and lower interengageable connector parts; a sealing gasket between said upper and lower interengageable parts; said stator windings having lead wires leading from said housing to said connector parts and connected to said cables at a connection; first continuous sealing compound resistant to humidity, vapor and gamma radiation, embedding said stator windings, said lead wires, said connection, at least a part of said cables and filling said grooves, said first continuous sealing compound extending from said housing into said connector parts; and a second continuous sealing compound resistant to humidity, vapor and gamma radiation, embedding upper portions of said cables in said upper interengageable connector part above said gasket, said first continuous sealing compound extending in said lower interengageable connector part up to said gasket and said second continuous sealing compound filling an upper portion of said upper interengageable connector part and extends down to a location above said gasket.

4,451,751
THREE-PHASE WINDING FOR A HIGH-VOLTAGE MACHINE

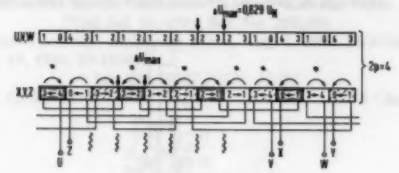
Herbert Auinger, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,077

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141239

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—184 **9 Claims**



1. In a three-phase winding for a high voltage machine with any number of poles 2p=4 and Y connected legs, formed of coil groups, each leg having two winding ends to provide a total of six winding ends, with the coil groups alternatingly connected in opposite directions, and connected in the same and the opposite sense with respect to the magnetization and potential direction to form "with" and "counter" coil groups which are distributed along the circumference and connected in series in such a manner that a reduction of the maximum voltages present between adjacent coil sides at the phase transitions is obtained, the improvement comprising an asymmetrically distributed arrangement and series connection of the individual coil groups of the three winding legs along the circumference such that upon reversal of the Y connections, the maximum voltages present at the phase transitions remain unchanged, the six winding ends being arranged physically side-by-side within a pole pair, the sums of the absolute values of the adjacent potential being at most $|U_1|+|U_2|=(3p-2)U_{SG}$ at the phase transitions which occur when the respective 2p coil groups of a leg are connected in series, where U_{SG} is the voltage of a coil group, whereby generally four and up to six wiring connections are installed side-by-side only over individual short sections of the circumference, to connect the individual coil groups on the coil head side.

4,451,752
STATOR OF D.C. ROTARY MACHINE

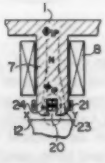
Kazuo Tahara; Takayuki Matsui; Haruo Koharagi, all of Hitachi; Seizi Yamashita, Katsuta, and Noriyoshi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,203

Claims priority, application Japan, Jun. 12, 1981, 56-89633

Int. Cl.³ H02K *23/22*

U.S. Cl. 310—186 **14 Claims**



1. A stator of a D.C. rotary machine comprising an annular yoke, a plurality of main pole cores disposed along the inner periphery of said yoke in a relation equally spaced apart by a predetermined distance from each other in the circumferential direction of said yoke, a main pole winding wound around each of said main pole cores, a plurality of interpole cores disposed also along the inner periphery of said yoke at positions intermediate between said circumferentially spaced main pole cores, and an interpole winding wound around each of said interpole cores, wherein magnetic flux adjusting means is provided adjacent to the radially inner end of each of said interpole cores for adjusting the magnetic flux passing through the half of the circumferential width of said interpole core, said magnetic flux adjusting means being formed by disposing interpole compensation windings circumferentially respectively biased toward the opposite sides of said interpole core relative to the circumferential center of said interpole core, each of said interpole compensation windings being supplied with an exciting current in a manner so that the intensity of the magnetic flux passing through the radially inner end of said interpole cores is substantially uniform along the end face of said interpole cores.

4,451,753
PIEZOELECTRIC DEVICE WITH SURFACE CHARGE SHUNT

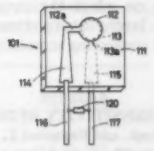
Toshio Ogawa, 8-89, Ooharanonishisakaidani-cho 3-chome, Nishikyo-ku, Kyoto-shi, Kyoto-fu, and Kikuo Wakino, 100-78, Mozume-cho, Kitanoguchi, Muko-shi, Kyoto-fu, both of Japan

Filed Jul. 15, 1980, Ser. No. 169,219

Claims priority, application Japan, Sep. 13, 1979, 54-118563; Oct. 2, 1979, 54-137067; Apr. 14, 1980, 55-49492; May 14, 1980, 55-64226

Int. Cl.³ H04R *17/00*

U.S. Cl. 310—315 **13 Claims**



1. A piezoelectric device, comprising:

a ferroelectric plate which is polarized in a polarization axis direction and which has first and second opposing surfaces intersecting said polarization axis direction;

first and second bulk wave electrodes formed on said first and second surfaces of said ferroelectric plate, respectively, said first and second electrodes cooperating with each other and with said ferroelectric plate to define a bulk wave piezoelectric component; and

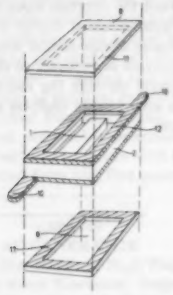
first and second withdrawing means connected to said first and second bulk wave electrodes, respectively;

a resistive resin material covering at least part of said ferroelectric plate and being in electrical contact with said first and second withdrawing means such that said resin material shunts an electric charge produced by the pyroelectric effect on said two surfaces of said ferroelectric plate, said resin material having a resistance of between 1k and 1000M ohms, the resistance value of said resistive resin material being selected to be smaller than the inherent resistance of said ferroelectric plate in said polarization axis direction.

4,451,754
HIGH FREQUENCY PIEZOELECTRIC RESONATOR

Silvano Stolz, Bienne, and Raymond Huguenin, Preles, both of Switzerland, assignors to Dryan-Fordahl Technologies S.A., Bienne, Switzerland

Filed Nov. 2, 1979, Ser. No. 90,842
Claims priority, application France, Nov. 16, 1978, 78 33350
Int. Cl.³ H01L 41/08
U.S. Cl. 310—348 5 Claims



1. Piezoelectric bar resonator adapted to vibrate in the thickness shear mode and employing the energy trapping principle, wherein a resonant element and a support therefor are blanked from a thin slab of piezoelectric material to form a single planar element of which the central portion comprises the resonant element in bar form and a surrounding portion forms a framework support, the two portions remaining attached to one another by at least one of the ends of the bar, and the upper and lower surfaces of the framework support being attached to first and second cover members at attaching zones that surround said central portion on opposite sides of said thin slab; wherein the cover members are of electrically insulating material, the framework support having on its upper and lower surfaces a thick metallic layer on which the cover members are supported, the metallic layers having externally projecting tabs serving as electrical connecting terminals to the resonator.

4,451,755
ACCELERATION SENSITIVITY REDUCTION METHOD

John R. Vig, Colts Neck, and Raymond L. Filler, Freehold, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1982, Ser. No. 434,998
Int. Cl.³ H01L 41/08
U.S. Cl. 310—361 3 Claims

1. Method of reducing the average acceleration sensitivity of a 10 megahertz, third-overtone AT-cut quartz crystal plate resonator from 3.5×10^{-9}/g to 7×10^{-10}/g comprising replacing a 2 diopter contour plano-convex quartz crystal plate with an 0.62 diopter contour plano-convex quartz crystal plate.

4,451,756
FLAT CATHODE RAY TUBE

Hiroki Sato, Chiba; Takao Nakano, Yokohama; Masato Hatanaka, Koshigaya; Toshio Ohhoshi, Yokohama, and Sakae Tanaka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,455
Claims priority, application Japan, Nov. 25, 1980, 55-165568
Int. Cl.³ H01J 29/70
U.S. Cl. 313—422 25 Claims

1. A cathode ray tube, comprising:

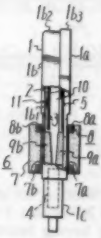
an evacuated envelope having at least one transparent flat portion;

a fluorescent target arranged on the inner surface of said flat portion;

an electron gun within said envelope in laterally spaced relation to said fluorescent target for emitting an electron beam along a path parallel with the surface of said flat portion;

first deflecting means comprising said fluorescent target and a back electrode in said envelope for impinging said electron beam upon said fluorescent target;

second deflecting means for deflecting said electron beam vertically comprising a pair of plates arranged in said envelope to pass said electron beam therebetween, one of



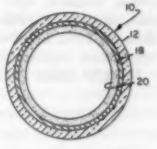
said pair of plates connected to said back electrode, and a vertical deflection signal applied to the other one of said pair of plates for deflecting said electron beam vertically on said fluorescent target and for dynamic focusing said electron beam;

third deflecting means for deflecting said electron beam laterally comprising external means arranged adjacent to said envelope for generating magnetic flux and concentrating said magnetic flux on said electron beam between said pair of plates, and deflecting said electron beam laterally on the said surface of said fluorescent target, thereby to produce an image on said fluorescent target.

4,451,757
FLUORESCENT LAMP HAVING IMPROVED MAINTENANCE

Costas C. Lagos, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 25, 1982, Ser. No. 342,531
Int. Cl.³ H01J 1/70; B05D 5/06
U.S. Cl. 313—489 4 Claims



1. A fluorescent lamp comprised of a tubular glass envelope having electrodes sealed in the ends thereof and having in its interior a luminescent material of a given weight, said luminescent material including a substantially homogeneous dispersion of a metallic borate in an amount effective to increase the lumen maintenance of said lamp, said borate having the general formula

$$MB_xO_yZH_2O$$

where

M=Na; Ba; Zn; or Ca; and

when M=Na, then x=4, y=7, and Z=10;

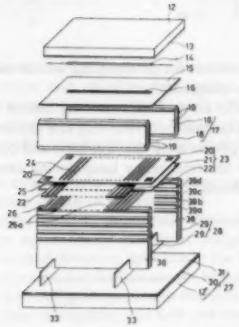
when M=Ba, then x=2, y=4, and Z=1;
when M=Zn, then x=4, y=9, and Z=5;
when M=Ca, then x=4, y=7, and Z=0; and
wherein said borate comprises from about 0.02 to about 0.12% by weight of said luminescent material.

4,451,758

PICTURE IMAGE DISPLAY DEVICE INCLUDING A ROW OF PARALLEL CONTROL ELECTRODES

Masanori Watanabe, Katano; Kinzo Nonomura, Hirakata, and Yoshinobu Takesako, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 29, 1981, Ser. No. 288,208
Claims priority, application Japan, Aug. 4, 1980, 55-107468; Dec. 19, 1980, 55-180693
Int. Cl.³ H01J *29/74, 31/00*
U.S. Cl. 313—495 **8 Claims**



1. A picture image display device comprising:
a flat type vacuum enclosure having a transparent face panel containing therein the following disposed in the following order:
a row of parallel disposed linear thermionic cathodes to produce electron emission,
an electron beam extracting electrode means which has through-openings to pass electrons of said electron emission therethrough, to form a predetermined number of electron beams of predetermined shapes out of said electron emission,
a row of first deflection electrodes disposed parallel to said linear thermionic cathodes,
control electrode means comprising a row of linear electrodes disposed parallel to each other in a direction perpendicular to those of said linear thermionic cathodes,
a row of second deflection electrodes disposed parallel to each other and also parallel to said control electrode means, and
a phosphor screen and an anode of thin metal film thereon formed on the inner face of said face panel.

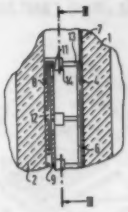
4,451,759

FLAT VIEWING SCREEN WITH SPACERS BETWEEN SUPPORT PLATES AND METHOD OF PRODUCING SAME

Hinrich Heynisch, Gräfelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,158
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036671
Int. Cl.³ H01J *9/24, 29/86*
U.S. Cl. 313—495 **7 Claims**

1. Flat viewing screen having a matrix of selectively addressable picture elements, comprising two mutually parallel support plates of glass being vacuum-tightly connected to each other and having sides facing each other, at least one separately addressable electrode disposed on each of said sides, a multiplicity of spacers each being assigned to one picture element for spacing said support plates from each other, each



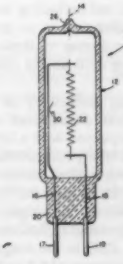
spacer including a pin being integral with and protruding from one of said support plates and a hollow cylinder having an inner surface and a bottom and being integral with and protruding from the other of said support plates, each pin being inserted into one hollow cylinder at a space from said inner surface and contacting said bottom of said hollow cylinder.

4,451,760

LONG LIFE INCANDESCENT TUNGSTEN-HALOGEN LAMP

Robert M. Griffin, South Hamilton, and Roy C. Martin, Salem, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,508
Int. Cl.³ H01K *1/08, 1/56*
U.S. Cl. 313—557 **8 Claims**

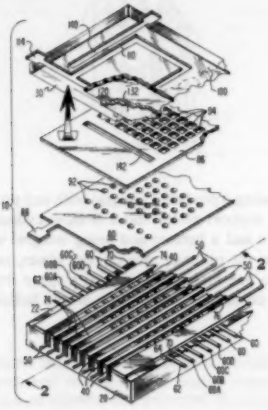


1. A tungsten-halogen lamp comprising: a light transmitting, hermetically sealed, glass envelope having a longitudinal axis; two lead-in wires sealed in said envelope and extending internally and externally thereof, one of said lead-in wires being long and the other being short, and said lead-in wires being substantially molybdenum or tungsten; a tungsten filament attached to said lead-in wires and extending substantially along said longitudinal axis; a fill gas within said envelope, said fill gas comprising krypton, nitrogen and a halogen; and means within said lamp for reducing sag and halogen corrosion of said filament, said means being copper; said copper being attached to said long lead-in wire.

4,451,761
GLASS COMPOSITION AND GAS-FILLED DISPLAY PANEL INCORPORATING THE GLASS AS AN INSULATING LAYER

Nicholas W. Kay, Mine Hill, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 13, 1982, Ser. No. 339,117
Int. Cl.³ H01J *17/49*; C03C *3/10*; 501 *76*
U.S. Cl. 313—586 **6 Claims**



1. A glass composition including PbO, SiO_2, B_2O_3, BaO, ZnO, Al_2O_3, and Na_2O, said glass composition, when fired on a soda-lime substrate, forming a glass layer having a thermal coefficient of expansion similar to that of soda-lime glass, a dielectric constant of at least 9, light transmissivity of at least 85%, and heatable to about 600° C. without distortion of the soda-lime substrate.

4. A display panel comprising

a gas-filled envelope,

said envelope being made up of a base plate and a face plate sealed together hermetically, said face plate comprising a soda-lime glass,

an array of rows and columns of scanning cells associated with said base plate and including an array of scan anodes and scan cathodes disposed at an angle to each other,

an array of rows and columns of display cells disposed adjacent to said scanning cells and in operative relation therewith,

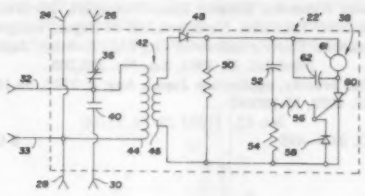
said display cells being defined by an apertured plate electrode and a large-area transparent electrode disposed on said face plate and covered with a layer of insulating glass, said insulating glass being compatible with soda-lime glass and being made from a glass composition including PbO in the range of 51 to 55 percent by weight, SiO_2 in the range of 12 to 16 percent by weight, B_2O_3 in the range of 10 to 15 percent by weight, BaO in the range of 8 to 12 percent by weight, ZnO in the range of 0 to 4 percent by weight, Al_2O_3 in the range of 0.5 to 2.5 percent by weight, and Na_2O in the range of 0.5 to 2.0 percent by weight.

4,451,762
CONTROL CIRCUIT AND SYSTEM FOR PROVIDING EMERGENCY LIGHTING

Don A. Forte, Newark, Ohio, and Michael B. Aldava, Tujunga, Calif., assignors to Manville Service Corporation, Denver, Colo.

Filed Jun. 18, 1982, Ser. No. 389,806
Int. Cl.³ H05B *39/10*
U.S. Cl. 315—87 **9 Claims**

1. In a system for providing normal and emergency lighting from a single source of electrical power capable of providing input power alternately in the form of a normal power signal and an emergency power signal during interruption of the normal power signal, the system including a first lamp capable of being energized by the normal power signal and an emergency lamp capable of being energized by the emergency power signal, a control circuit adapted to alternately receive the normal and emergency power signals, said control circuit comprising:



a detection circuit for determining which one of said power signals is being received, and

an electrically controlled switching circuit coupled to said detection circuit for selectively and automatically removing input power from the first lamp and coupling the input power to the emergency lamp during emergency operating conditions.

4,451,763
ELECTRONIC LAMP CONTROL APPARATUS

Gregory L. Sodini, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 374,983
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—159 **2 Claims**

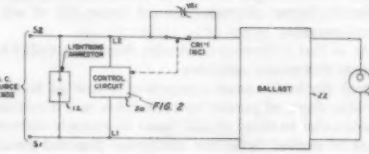


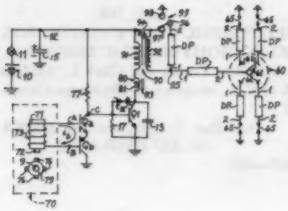
FIG. 2

1. A control circuit for an outdoor luminaire including a lamp having a photoelectric cell controlled turn off and turn on, a power supply circuit for providing said photoelectric cell and said lamp, first bistable means for illuminating said lamp when the ambient light on said cell is below a predetermined level, a solid state clock powered by said power supply, said clock settable to emit an output pulse at a time set on said clock, a second bistable means, means coupling said second bistable means to said clock to set said second bistable means in response to said output pulse from said clock, a switch responsive to the setting of said second bistable means to switch said first bistable means and shut off said first bistable means, and timing means coupled to said second bistable means to initiate a timing cycle responsive to the setting of said second bistable means, and said timing means operative at the end of a timed cycle to reset said second bistable means and switch said first bistable means.

4,451,764
IGNITION SYSTEM HIGH VOLTAGE CABLE WITH MINIMIZED RADIO INTERFERENCE

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed May 5, 1983, Ser. No. 491,750
Int. Cl.³ H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 4 Claims



1. A transmission cable, in an ignition system having an ignition transformer and an electrical igniter, for enabling ignition current to be fed to said igniter, said cable comprising:

an insulating core elongated along the length of the cable and substantially constituting the axis of elongation of the cable;

first inductive means, wound in a first direction substantially over the entire length of the core; and

second inductive means, electrically insulated from and wound over substantially the entire length of the first means in a second direction opposite to the first direction, said first and second inductive means being connected in parallel for passing ignition current therethrough between the transformer and igniter, said first and second inductive means being coaxial windings each of which comprise turns of insulated wire, said turns being wound in a plane substantially perpendicular to the axis of elongation and in close proximity to each other.

3. A transmission cable within an ignition system, said system having an ignition transformer and an electrical igniter, for enabling ignition current to be fed to said igniter, said cable comprising:

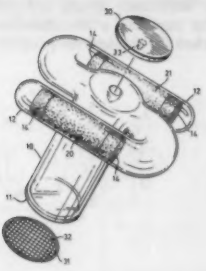
a distributed parameter component having a first electrically conductive elongated member and a second electrically conductive elongated member insulated from the first member, said component having a first end and a second end opposite from the first end, the first member being terminated at said first end and the second member being terminated at said second end, said first member being unterminated at said second end and said second member being unterminated at said first end, said terminated ends electrically coupling the transformer to the igniter, said members being straight and substantially parallel to each other.

4,451,765
RESONANCE LAMP

Lawrence H. Gray, Tottenham, Canada, assignor to Moniteq Ltd., Concord, Canada

Filed May 24, 1982, Ser. No. 381,649
Int. Cl.³ H05B 41/24
U.S. Cl. 315—248 8 Claims

1. A resonance lamp system comprising a hollow body of dielectric material defining a main lamp cavity free of internal obstructions, and at least one side arm having a cavity communicating with the main lamp cavity, one such side arm containing a getter, a high purity rare gas filling the body and having a pressure greater than 2 Torr, a window in the body at at least one end of the main lamp cavity transverse to an optical axis of the latter and transparent to light of desired wavelengths to be produced by the lamp, first and second electrodes in planes transverse to said optical axis outside and at opposite ends of the main lamp cavity, a source of electrical energy at radio frequency, and a matching network connecting the source to

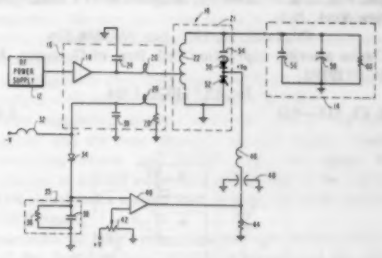


said electrodes whereby to incorporate the electrodes into a high-Q circuit resonant at the frequency of the source.

4,451,766
RADIO FREQUENCY LASER PUMPING SYSTEM

Elwyn R. Angle, Lomita, and John L. Wilkerson, Torrance, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 3, 1982, Ser. No. 373,936
Int. Cl.³ H01J 61/56
U.S. Cl. 315—248 10 Claims



1. An improved laser power supply including

variable impedance matching means for matching the impedance of a laser cavity with a source of RF energy;

means for sensing a change in the impedance of said laser cavity;

means for changing the impedance of said variable impedance matching means in response to the sensed change in the impedance of said laser cavity;

whereby the RF source is optimally coupled to said laser cavity to enhance start-up and facilitate an optimal energy transfer.

4,451,767
TEMPERATURE SENSITIVE BALLAST CIRCUIT FOR A FLUORESCENT LAMP

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

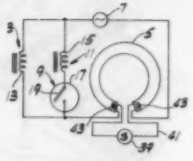
Filed Feb. 22, 1982, Ser. No. 351,158
Int. Cl.³ H05B 41/14
U.S. Cl. 315—309 13 Claims

1. A ballast circuit for a fluorescent lamp including a gaseous discharge light bulb which for a given input power produces a decreasing amount of light as the bulb temperature decreases below a designed operating temperature at which the amount of light produced is a maximum, the ballast circuit comprising:

means for sensing the ambient temperature in the vicinity of the bulb;

the ballast circuit being adapted to be connected in series with the bulb and having

multi-stage impedance means controlled by said sensing means for imposing a predetermined impedance in the circuit when the ambient temperature is above a threshold



temperature which is generally a predetermined number of degrees below said designed operating temperature, and for imposing a lower impedance when the ambient temperature is below said threshold temperature to increase the bulb current and thus the light output of the bulb, whereby the light output of the bulb is maintained for ambient temperatures below said threshold temperature.

4,451,768

WINDSHIELD WIPER CONTROL CIRCUIT

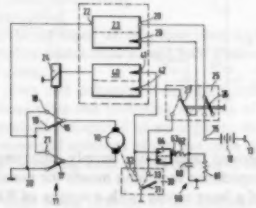
Alfred Kohler, and Horst Rachner, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,426

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129192

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 **5 Claims**



1. In a windshield wiper assembly comprising:

a voltage source;

at least one wiper;

an electric motor coupled to said at least one wiper and connectable to said voltage source;

an operating switch;

a switching stage for controlling said electric motor in response to the state of said operating switch such that when said operating switch is in a first state said electric motor is coupled to said voltage source for moving said at least one wiper in pendulum fashion between two reversing positions within a wiping area, and when said operating switch is in a second state said electric motor moves said at least one wiper to a depressed parking position wherein said electric motor is uncoupled from said voltage source;

at least one position switch activated by said electric motor for generating a first switching signal when said wiper is at one of said reversing positions adjacent said depressed parking position; the improvement wherein:

said switching stage comprises a timing element coupled to said at least one position switch and operable such that after said operating switch is placed in said second state said electric motor remains connected to said voltage source and said first switching signal triggers said timing element, said switching stage being responsive to said timing element such that said electric motor is disconnected from said voltage source only after a delay time determined by said timing element.

4,451,769

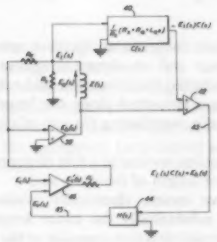
ELECTRONIC COMPENSATOR FOR AN ELECTROHYDRAULIC SERVOVALVE

George E. Minnich, Vestal, and Clark L. Applegate, Binghamton, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,058

Int. Cl.³ G05D *17/00*

U.S. Cl. 318—689 **7 Claims**



1. Apparatus for modifying an input control signal to produce a drive signal controlling a driveable physical element in the form of a servo-valve driven by a torque motor having a frequency variable response characteristic, comprising:

means to provide a feedback control signal that corresponds to the dynamic motion of said physical element and that includes means to determine a difference voltage between a first voltage across the armature of said torque motor when it is moving and a second voltage when it is not moving;

compensation means responsive to said feedback control signal for compensating said element so as to avoid resonance of said element; and

feedback means connected to said compensation means for producing a modified control signal.

4,451,770

METHOD AND APPARATUS FOR DETERMINING THE RESISTANCE OF AN AC MOTOR STATOR

Fred H. Boettner, Salem; John H. Cutler, Roanoke, and Loren H. Walker, Salem, all of Va., assignors to General Electric Company, Salem, Va.

Filed May 11, 1983, Ser. No. 493,405

Int. Cl.³ H02P *3/18*

U.S. Cl. 318—757 **24 Claims**

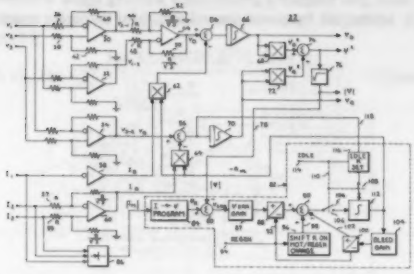
1. A system for deriving a signal proportional to the stator resistance of an alternating current motor, capable of operating in motoring and regenerative modes, provided with electrical power from a polyphase alternating current power source comprising:

(a) means to develop voltage signals and current signals representing, respectively, the voltage and current supplied to said motor from said source;

(b) means response to said voltage signals, said current signals and said signal proportional to the stator resistance of said motor to develop a calculated flux signal representing the magnitude of the actual flux developed by the motor;

(c) means responsive to said current signals to develop a signal representing the anticipated motor flux resulting from said current;

(d) means to combine said calculated flux signal and said anticipated flux signal to provide a flux error signal;
(e) means to determine the polarity of said flux error signal, as a function of whether said motor is in the motoring or

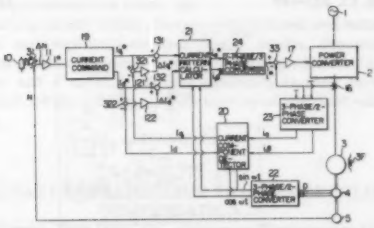


regenerative mode of operation, to provide an adjusted flux error signal; and,
(f) means to integrate said adjusted flux error signal to thereby develop said signal proportional to the stator resistance of said alternating current motor.

4,451,771
APPARATUS FOR CONTROLLING AC MOTOR

Hiroshi Nagase, Hitachi; Hisakazu Ninomiya, Funabashi, and Satoshi Ibori, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,057
Claims priority, application Japan, Jan. 18, 1982, 57-5017
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—800 3 Claims

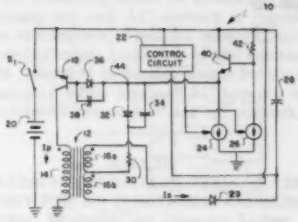


1. A control apparatus for an AC motor comprising:
(a) an AC motor driven by a power converter;
(b) current command means for producing a current command signal to instruct the magnitude of a motor current to be supplied to said AC motor;
(c) current pattern calculating means for obtaining a current pattern signal based on a sinusoidal signal which determines a phase of said motor current;
(d) current control means for controlling said power converter so as to cause said motor current to agree with said current pattern signal;
(e) current detecting means for detecting said motor current to produce a current detecting signal;
in which said apparatus further comprises;
(f) current correction control means for obtaining a current deviation of said current detecting signal from said current command signal so as to produce a current correction signal proportional to said current deviation and adding said current correction signal to said current command signal so as to apply the sum to said current pattern calculating means.

4,451,772
PASSIVE CLAMP FOR ON/OFF CONTROL OF A CAPACITOR CHARGER

Gregory D. Moberg, and Lynn R. Hudson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,537
Int. Cl.³ H02P *13/22*
U.S. Cl. 320—1 5 Claims

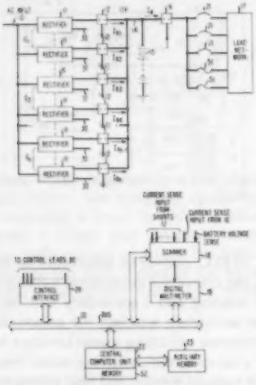


1. In a D.C. to D.C. converter adapted to be energized by a power supply, the converter comprising a transformer including a primary winding and a secondary winding, a capacitor coupled to the secondary winding for accumulating electric energy, first transistor switching means having a base electrode and an emitter electrode, the switching means being coupled in series with the power supply and the primary winding for periodically interrupting power supply current to the primary winding, and a control circuit for detecting the charge status of the capacitor, the control circuit being arranged to produce a converter ON signal and a converter OFF signal, the improvement comprising:
second transistor switching means having a base electrode, a collector electrode and an emitter electrode;
current regulating means connected between the control circuit and the base electrode of said second transistor switching means, said current regulating means being adapted to assume a first state in response to the converter ON signal and a second state in response to the converter OFF signal;
semiconductor means connected between the base electrode of the first transistor switching means and the emitter electrode of said second transistor switching means, and providing a first predetermined voltage at the emitter electrode of said second transistor switching means when said current regulating means assumes its first state; and
a resistor connected between the power supply and the junction between the base electrode of said second transistor switching means and said current regulating means, the size of said resistor being such that (1) when said current regulating means is in said first state a second predetermined voltage is developed at the base electrode of said second transistor switching means, the difference between said first and second voltages rendering said second switching means non-conductive, and (2) when said current regulating means is in said second state, the first transistor switching means is turned off and said second transistor switching means assumes a stand-by state in which electrical noise of a particular polarity and sufficient magnitude may cause the first and second transistor switching means turn on, but in which the voltage drop across the emitter-base junction of the first transistor switching means is clamped by the collector-emitter voltage of the second transistor switching means at a low level that is insufficient to drive the first transistor switching means into heavy conduction, whereby the first transistor switching means turns off once such noise terminates.

4,451,773
RECTIFIER CONTROL SYSTEM FOR A DC POWER PLANT SYSTEM

Thomas V. Papathomas, Madison, N.J.; Rudolph Scuderi, deceased, late of Mountain Lakes, N.J.; by May S. White, co-executrix, and by Camille D'Ambrose, co-executrix, both of Amsterdam, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1982, Ser. No. 365,017
Int. Cl.³ H02J 7/04; H02M 7/08
U.S. Cl. 320—59 **28 Claims**



1. A method of controlling an ON/OFF operational state of individual rectifiers in a power plant system to maximize power efficiency of the power plant system comprising the steps of

determining a present load current demand for a load energized by the power plant system,

determining a sum of rated current capacities of rectifiers presently operating,

periodically comparing the present load current demand with the sum of rated current capacities of presently operating rectifiers and establishing a difference value between the sum of rated current capacities and the load current demand,

periodically responding to the difference value between the load current demand and the sum of rated current capacities of presently operating rectifiers by changing an operational state of a sufficient number of rectifiers selected with specific rated capacities so as to have a sum of rated current capacities of subsequently operating rectifiers substantially equal to the load current demand.

4,451,774
VEHICLE MOUNTED VOLTAGE REGULATOR

Yoshio Akita, Chiryu; Takanori Teshima, Kariya; Toshinori Maruyama, Iwakura, and Koshi Torii, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 3, 1982, Ser. No. 354,432
Claims priority, application Japan, Mar. 6, 1981, 56-32860; Apr. 20, 1981, 56-60479
Int. Cl.³ H02J 7/24
U.S. Cl. 320—64 **11 Claims**

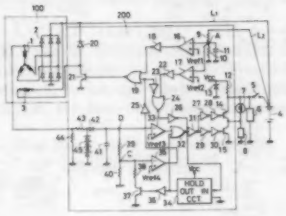
1. A voltage regulator for a storage battery coupled to an alternator through a recitifer, said alternator being driven by an engine mounted on a vehicle, comprising:

first detecting means for detecting when the voltage of said battery reduces below a higher reference level;

second detecting means for detecting when the voltage of said battery reduces below a lower reference level;

third detecting means for detecting when the voltage generated by said alternator rises above a predetermined level, said third detecting means comprising comparator means for comparing the alternator voltage with a variable reference level which is variable in response to the absence and presence of said warning signal and generating a comparator output when said alternator voltage is lower than said variable reference level;

logic gate means for generating a warning signal in response to outputs from said second and third detecting means;



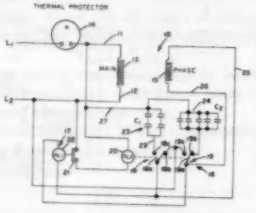
a semiconductor switching element for supplying said alternator voltage to a field coil of said alternator; and

switching control means for controlling said switching element in response to said first detecting means and to said comparator output to cause said switching element to operate said alternator in a high output state and controlling said switching element in response to said logic gate means to operate said alternator in a low output state.

4,451,775
MOTOR/GENERATOR STARTING CIRCUIT

Graham R. Phillips, St. Louis, and Norvell G. Prudot, Imperial, both of Mo., assignors to Century Electric, Inc., St. Louis, Mo.

Filed Aug. 12, 1981, Ser. No. 292,336
Int. Cl.³ H02P 9/06, 9/46
U.S. Cl. 322—10 **12 Claims**



1. A circuit for controlling an electrodynamic machine having a main winding and a phase winding for starting the machine in a motoring mode and switching to a generating mode as an incident of the machine reaching a preselected speed, said circuit comprising:

means for energizing the main winding;

first capacitor means;

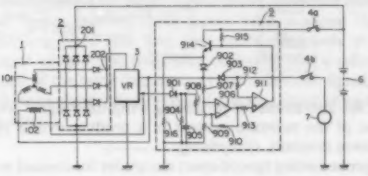
second capacitor means having a capacitance lower than that of said first capacitor means; and

control means for energizing the phase winding in a first direction of connection in series with said first capacitor means for causing said machine to operate in a motoring mode, and discontinuing energization of the phase winding in said first direction of connection and energizing the phase winding in a second direction of connection opposite to said first direction and in series with said second capacitor means as an incident of said machine reaching said preselected speed to cause said machine to operate in a generating mode.

4,451,776
CHARGING GENERATOR CONTROL SYSTEM

Yoshiyuki Iwaki, Himeji; Mitsuyoshi Yokota, and Akio Matsumoto, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 23, 1983, Ser. No. 497,018
Claims priority, application Japan, May 31, 1982, 57-81812[U]
Int. Cl.³ H02P 9/10, 9/14
U.S. Cl. 322—22 7 Claims

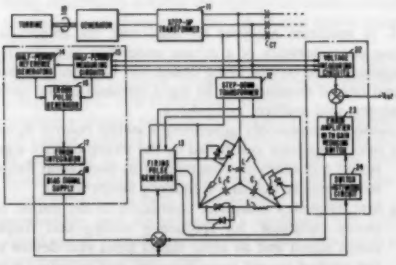


1. A charging generator control system comprising:
a generator which includes a field winding, and an armature winding being in three-phase connection to generate an A.C. output;
a rectifier which rectifies the A.C. output from said armature winding of said generator;
a battery which is charged with a D.C. output from said rectifier and which can supply an exciting current to said field winding;
a separately-exciting power source which generates a D.C. voltage having magnitude independent of the generator output and which can supply an exciting current to said field winding;
a voltage regulator which controls the exciting current flowing through said field winding of said generator, thereby to control the output voltage of said generator to be a predetermined value; and
a switching circuit which changes-over between said battery and said separately-exciting power source, depending upon a rotating speed of said generator, a condition of a load and a capacity of said separately-exciting power source, as the exciting current sources of said field winding.

4,451,777
STATIC VAR GENERATION FOR TRANSMISSION LINE COMPENSATION

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1981, Ser. No. 300,842
Int. Cl.³ H02J 3/16
U.S. Cl. 323—210 2 Claims

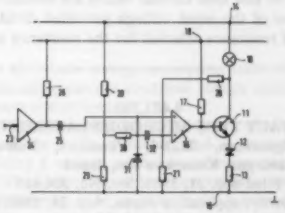


1. A static VAR generator and network stabilizer, comprising:
(a) a reactance means disposed for connection into an AC network;
(b) a VAR monitoring means for monitoring the reactive requirements of said AC network;
(c) a frequency monitoring means for measuring the period of the network voltage cycle and comparing it to the period of a reference voltage cycle to detect subsynchronous resonance in said AC network;
(d) a control means connected to said reactance means and said VAR monitoring means for connection of said reactance means into said AC network in response to the reactive requirements of said AC network; and
(e) said control means connected to said reactance means and said frequency monitoring means for connection of said reactance means into said AC network to dampen subsynchronous resonance in said AC network.

4,451,778
SHORT-CIRCUIT-RESISTANT TRIGGER CIRCUIT LAYOUT FOR AN ELECTRICAL CONSUMER

Werner Fischer, Ditzingen, and Johannes Locher, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 382,451
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128116
Int. Cl.³ G05F 1/56
U.S. Cl. 323—282 3 Claims



1. A short-circuit-protection trigger circuit layout for an electrical consumer, the consumer being connected in series with a switching transistor, comprising:
an operational amplifier connected to the switching transistor for raising and lowering the conductivity thereof;
a voltage divider comprising resistor means connected in parallel to the switching transistor;
means for providing an average constant potential; and
means for providing a dynamic switching signal, wherein:
(i) one input of the operational amplifier is connected to the junction point of the voltage divider; and
(ii) the other input of the operational amplifier is connected to the means for providing an average constant potential and to the means for providing a dynamic switching signal.

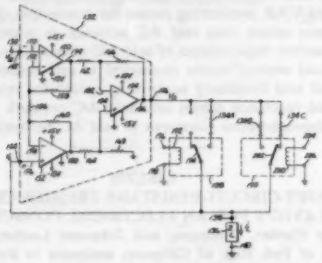
4,451,779
VOLTAGE CONTROLLED CURRENT SOURCE

Jonathan P. Griep, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1982, Ser. No. 370,694
Int. Cl.³ G05F 3/08
U.S. Cl. 323—312 8 Claims

1. A voltage controlled current source for providing a desired load current through a selected load impedance means which is a function of a provided input voltage taken with respect to a provided reference voltage and which load current is substantially independent of that impedance value chosen for the load impedance means, the voltage controlled current source comprising:

a high input impedance unity gain amplifier means having a first input, a second input and an output, the first input adapted to receive the input voltage and the second input adapted to receive that load voltage provided by flow of the load current through the load impedance means, the amplifier means providing an output voltage at the output thereof which is substantially equal to that difference



occurring between the load voltage and the input voltage as provided; and

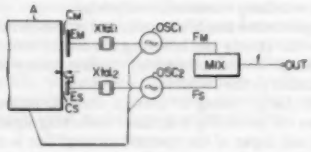
a resistance means adapted to be electrically connected in a series current path with the load impedance means between the output of the amplifier means and the reference voltage so that load current values are substantially equal to values of the input voltage provided divided by that value of resistance selected for the resistance means.

4,451,780

NON-CONTACT TYPE MICRODISPLACEMENT METER

Hiroomi Ogasawara, 3821-4, Yamakita, Yamakitamachi, Ashigarakami-gun, Kanagawa-ken, Japan

Filed Sep. 21, 1981, Ser. No. 304,415
Claims priority, application Japan, Sep. 26, 1980, 55-134029
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R **9 Claims**



1. A non-contact type microdisplacement indicating circuit for determining the displacement of an object comprising:

a main electrode having an area A_M;

an auxiliary electrode having an area A_S;

means positioning said main electrode to confront the object at a distance d_M, to form therewith a first capacitor having a capacitance C_M, which is a function of A_M and d_M, and positioning said auxiliary electrode to confront the object at a distance d_S, to form therewith a second capacitor having a capacitance C_S, which is a function of A_S and d_S;

a first oscillator circuit having said first capacitor incorporated therein as a frequency varying component;

a second oscillator circuit having said first capacitor incorporated therein as a frequency varying component; and

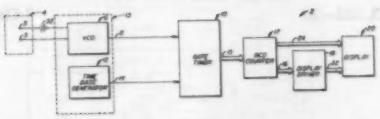
a mixer coupled to said first and second oscillator circuits for providing a frequency difference signal determined by the difference in the frequencies of said first and second oscillator circuits.

4,451,781

MOISTURE TESTER

James W. Anderson, Tulelake, Calif., assignor to Sarah Anderson, Tulelake, Calif., a part interest

Filed May 20, 1981, Ser. No. 265,279
Int. Cl.³ G01R 27/02
U.S. Cl. 324—65 R **5 Claims**



1. An instrument for producing a digitized signal respresentative of the moisture content of a product over a range of moisture contents, comprising:

a probe having spaced-apart electrodes for contact with said product;

converter means, electrically coupled to said electrodes of said probe, for producing a first signal at a first output having a first frequency generally proportional to the resistance across said electrodes;

clock means for producing a standard frequency signal at a second output;

a gate timer circuit electrically connected to said first and second outputs; and

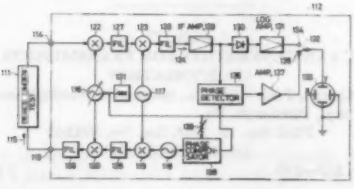
digital counter circuit means, electrically coupled to said gate timer circuit, for producing a digitized output signal at a third output, said digitized output signal being a digital representation of a value proportional to the resistance across said electrodes.

4,451,782

SPECTRUM ANALYZER

Hitoshi Ashida, Higashimatsuyama, Japan, assignor to Takeda Riken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,090
Claims priority, application Japan, Oct. 8, 1980, 55-141035
Int. Cl.³ G01R 23/16
U.S. Cl. 324—77 C **22 Claims**



1. A spectrum analyzer for analyzing the amplitude and phase characteristics of a device under test as a function of frequency, said device being connected between a measuring signal output terminal and an input terminal of the spectrum analyzer, said analyzer comprising:

means for repeatedly generating a sweep control signal,

a sweep oscillator controlled by the sweep control signal to repeat a continuous sweeping of its oscillation frequency to repeatedly output a frequency swept signal,

a first frequency converter connected to the output of the sweep oscillator, for frequency mixing said frequency swept signal and an input signal from said device under test applied to said input terminal, and to output a corresponding signal;

a first detector connected via a first path to the output of the first frequency converter for detecting a signal corre-

sponding to the amplitude of the output of the first frequency converter;

a first oscillator outputting an oscillating signal at a frequency equal to the frequency of a signal in said first path;

a second frequency converter for frequency mixing a signal corresponding to the output from said first oscillator and said frequency swept signal, and for producing a measuring signal to be supplied to said measuring signal output terminal, said second signal having the same frequency as said output from said first frequency converter; and

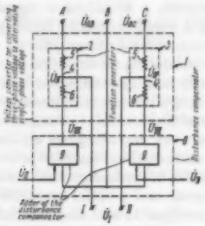
a second detector for detecting the phase difference between two inputs thereto, these inputs being a signal that is taken-out from said first path and corresponds to said output of said first frequency converter and a reference signal of the same frequency as said taken-out signal, said reference signal being derived from the output of said first oscillator.

4,451,783

METHOD OF DETECTING SYMMETRICAL COMPONENTS OF SUPPLY-LINE THREE-PHASE VOLTAGE AND DEVICE FOR CARRYING OUT SAME

Anatoly K. Shidlovsky; Sergei G. Taranov; Voldmir V. Braiko, all of Kiev; Isaak P. Grinberg, Zhitomir; Jury F. Tesik, and Oleg L. Karasinsky, both of Kiev, all of U.S.S.R., assignors to Institut Elektrodinamiki Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Sep. 3, 1981, Ser. No. 299,088
Int. Cl.³ G01R *25/00*
U.S. Cl. 324—86 **16 Claims**



1. A method of detecting symmetrical components of a three-phase supply-line voltage, comprising:

converting said supply-line three-phase voltage to alternating single-phase voltage with the aid of at least two function generators coupled to different lines of said three-phase supply line, with at least one of said function generators being an active-reactive circuit comprising an active element and exhibiting inductive or capacitive reactance which can be electrically varied, said voltage conversion being effected by altering the supply-line linear voltage in amplitude and phase with the aid of said active-reactive circuits,

subsequently summing the output voltages of said function generators to produce voltages comprising symmetrical components of said three-phase voltage,

generating a control signal proportional to a perturbation in the output voltages of said active-reactive circuits due to an electrical or environmental disturbance, said control signal being equal to the difference in voltage drops between elements in each active-reactive circuit,

compensating said disturbance by summing said control signal and voltage drop across one of said elements in each active-reactive circuit, and

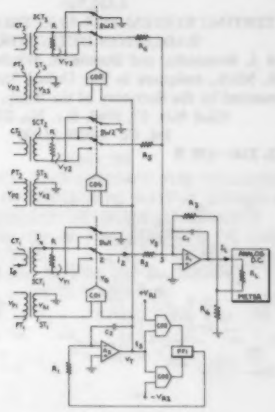
displaying or communicating a signal corresponding to the amplitude of at least one of said voltages comprising symmetrical components of said three phase voltage.

4,451,784

ELECTRONIC WATT TRANSDUCER CIRCUIT WITH CONSTANT DC CURRENT OUTPUT PROPORTIONAL TO WATTS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Oct. 21, 1981, Ser. No. 313,275
Int. Cl.³ G01R *7/00*
U.S. Cl. 324—142 **13 Claims**



1. In an electronic energy consuption wattmeter for monitoring alternating current electrical energy consumption, the improvement comprising:

first transformer means having a primary winding excited by the voltage to be measured and a secondary winding providing a voltage related signal proportional thereto;

second transformer means having a primary winding excited by the current to be measured and a secondary winding providing a current related signal proportional thereto;

pulse-width modulator means operatively connected to receive said voltage related signal and responsive to a repetitive sampling signal for producing repetitive modulated output pulse signals having instantaneous pulse widths proportional to the corresponding instantaneous magnitude of said voltage related signal;

double-pole double-throw electronic switch multiplier means operatively connected to be automatically switched between first and second operating states in response to said repetitive modulated output pulse signals;

said electronic switch multiplier means having first and second inputs connected across the secondary winding of the second transformer means and having a switch output which is controllably and alternatively connected to said first switch input during said first switch operating state and to said second switch input during said second operating state, respectively, in response to said modulated output signals from said pulse width modulator means whereby the resultant output electrical signal pulses across said switch output comprise alternating polarity pulse width and amplitude modulated signal pulses having instantaneous pulse widths proportional to said voltage related signal and instantaneous amplitudes proportional to said current related signal and a D.C. component proportional to the product of said voltage related signal and current related signal and hence to the power consumption represented by the electric voltage and electric current being monitored; and

averaging type current-to-current converter means connected to the output from said electronic switch multiplier means and supplied with the alternating polarity resultant pulse width and amplitude modulated output signal pulses

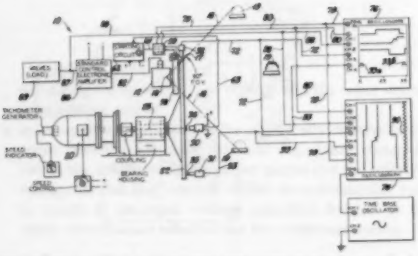
for averaging the output signal pulses over a full cycle of the alternating current electric energy being monitored and providing an output analog direct current electric signal proportional to watts.

4,451,785

TESTING SYSTEM FOR ELECTRO-OPTICAL RADIATION DETECTORS

Edward J. Rozniecki, and Donald R. Wittbrodt, both of Macomb, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 27, 1981, Ser. No. 325,471
Int. Cl.³ G01R *31/00*
U.S. Cl. 324—158 R 8 Claims



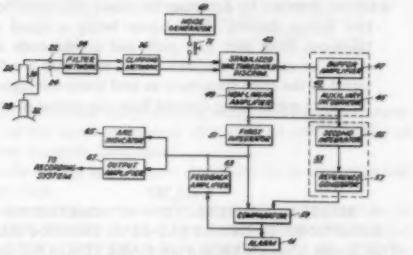
1. Mechanism for testing the electrical response time of an optical radiation detector (12) designed to have a sighting window (16) exposed to radiation for generating an electrical output signal after a predetermined exposure time to a given type of radiation: said testing mechanism comprising an electrically-operated shutter (58) positioned in close proximity to the sighting window of the detector for normally shielding the detector from a test radiation source (19); electric means (59) for opening the shutter; a rotary disc (22) positioned in close proximity to the shutter for interrupting the flow of radiant energy from the aforementioned test radiation source to the shutter; motor means (20) for rotating the disc around an axis spaced from a line of sight taken through the detector window and shutter; said disc having an opening (24) offset from the disc rotational axis, whereby said opening passes across the shutter once during each revolution of the disc; the disc opening having a leading edge (25) and a trailing edge (27); electric means (30,36) for generating a first start signal when the disc is in a known position shielding the shutter from the radiation source; a manually-controlled circuit (62) interconnecting the start signal means and shutter opening means (59), whereby the shutter undergoes an opening action while the disc is shielding the shutter from the test radiation source; means (32) for generating a second electric signal when the leading edge of the disc opening (24) is passing across the shutter line of sight, thereby signalling the precise moment when the detector under test begins to be exposed to the test radiation source; and third electric signal means (88) connected with the electrical output of the detector under test, said last mentioned electric signal means providing a third signal representing the moment when the detector has generated a useful output signal resulting from exposure to the test radiation source; the elapsed time between the second and third signals constituting the response time of the detector under test; the aformentioned disc opening (24) having a sufficient circumferential length, measured from its leading edge to its trailing edge, that satisfactory detector response times are achieved while the disc opening is in optical communication with the shutter line of sight.

4,451,786

HIGH SENSITIVITY BRUSH ARCING MONITOR FOR A DYNAMOELECTRIC MACHINE

Fred H. Sawada, Scotia; James S. Bishop, and Llewellyn A. Blaize, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,238
Int. Cl.³ G01R *31/02;* G08B *21/00*
U.S. Cl. 324—158 MG 10 Claims



1. In apparatus for monitoring arcing of brushes in an electrical generator, such apparatus being of the type including means receiving from at least one brush a composite signal comprised of high frequency brush arcing components, low frequency components, noise spikes, and high frequency background noise whose amplitude depends upon generator loading; signal conditioning means removing said low frequency components and attenuating said noise spikes to a preselected amplitude to provide a conditioned signal; a discriminator network having a signal threshold limiting said conditioned signal to signal components of one polarity above said threshold; an amplifier producing an amplified signal from the conditioned signal from said discriminator; and a first integrator integrating said amplified signal to produce a first integrated signal indicative of brush arcing; an improvement comprising:

a feedback network including an auxiliary integrator for integrating said amplified signal to provide a feedback bias signal indicative of the background noise contained in said amplified signal, and a buffer amplifier for applying said feedback bias signal to said discriminator, said discriminator being responsive to said feedback bias signal to vary said threshold level up or down as a function of said signal.

4,451,787

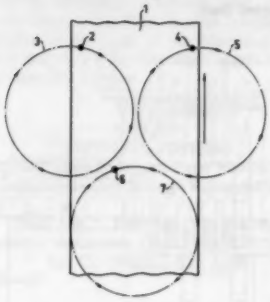
METHOD AND APPARATUS TO DETECT RANDOMLY DISTRIBUTED DISCONTINUITIES IN DIFFERENT DIRECTIONS IN A LONGITUDINALLY MOVING WEB USING ROTATING PROBES IN OVERLAPPED PATHS

Karl-Gunnar Bergstrand, 82 Sikvägen, Frösön, Sweden (S-832 00), assignor to Karl-Gunnar Bergstrand, Frösön and Bergstrand Kvalitetskontroll AB, Östersund, both of, Sweden

PCT No. PCT/SE80/00135, 371 Date Jan. 7, 1981, 102(e) Date Jan. 7, 1981, PCT Pub. No. WO80/02594, PCT Pub. Date Nov. 27, 1980
PCT Filed May 9, 1980, Ser. No. 229,585
Claims priority, application Sweden, May 11, 1979, 7904155
Int. Cl.³ G01N *27/72;* G01R *33/12*
U.S. Cl. 324—242 8 Claims

1. A method for detecting laterally, longitudinally and randomly distributed discontinuities in a longitudinally moving web of material by means of probes sensitive to such discontinuities, said method comprising moving a plurality of said probes in circular paths of substantially equal radii across the moving web in planes disposed substantially parallel to the plane of the web, said plurality of probes including at least first and second probes which each define a path of travel across at least a portion of said web, said first and second probes being

rotated while mutually displaced longitudinally with reference to the direction of web travel, and while mutually displaced laterally with reference to the direction of web travel by a distance of one radius such that one-half of the circular path of said first probe laterally overlaps one-half of the circular path of the second probe to an extent sufficient to cover at least a



portion of the width of said web, the number of said probes being such that the entire width of said web travels past laterally overlapped half-circular paths, the direction of travel of said first probe being different from that of said second probe with respect to a given discontinuity on said web so that such discontinuity is detected in both of said two directions of travel of said probes.

4,451,788

METHODS OF PRODUCING IMAGE INFORMATION FROM OBJECTS

William A. Edelstein, Schenectady, N.Y.; James M. S. Hutchison; Glyn Johnson, both of Aberdeen, Scotland; Thomas W. T. Redpath, Stonehaven, Scotland, and John R. Mallard, Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

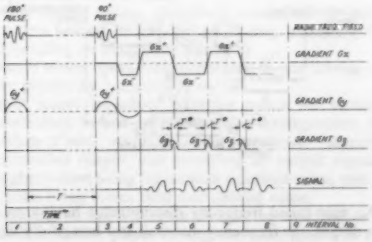
PCT No. PCT/GB81/00045, 371 Date Nov. 9, 1981, 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02789, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 13, 1981, Ser. No. 320,951

Claims priority, application United Kingdom, Mar. 14, 1980, 8008773

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **12 Claims**



1. A method of deriving image information from an object using nuclear magnetic resonance signals comprising subjecting an object to a continuous static magnetic field along an axis and carrying out the following sequence of steps:

(1) exciting nuclear spins in a selected plane,

(2) applying a first gradient of the magnetic field which has a gradient direction parallel to the said plane together with a second gradient of the magnetic field having a gradient direction perpendicular to the said plane,

(3) repeatedly applying the said first gradient with successive reversals of gradient direction, applying the third gradient of the magnetic field which has a gradient direction parallel to the said plane and orthogonal to the direction of the first gradient during each successive reversal of said first gradient, and holding the said first gradient with its successively reversed gradient directions for time intervals during which successive echoing free induction decay signals are read out.

4,451,789

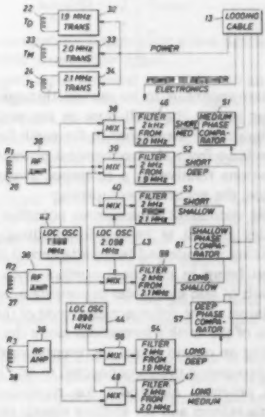
LOGGING TOOL AND METHOD FOR MEASURING RESISTIVITY OF DIFFERENT RADIAL ZONES AT A COMMON DEPTH OF MEASUREMENT

Richard A. Meador, Spring, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,209

Int. Cl.³ G01V *3/30*

U.S. Cl. 324—338 **15 Claims**



7. Apparatus for measuring parameters in the environment surrounding a borehole, including an elongated housing for passing into the borehole, comprising:

a plurality of transmitting means mounted in a spaced longitudinal configuration on said housing;

means for operating each of said transmitting means at a different frequency;

a plurality of pairs of receiving means spaced a measured distance from said transmitting means and arranged in a spaced longitudinal configuration on said housing;

local frequency generating means for generating a plurality of local frequencies, each local frequency corresponding to a transmitting frequency;

a plurality of separate mixing means associated with each receiver of said receiving pair means for separately mixing one or more of the frequencies received at each receiving means with a different local frequency; and

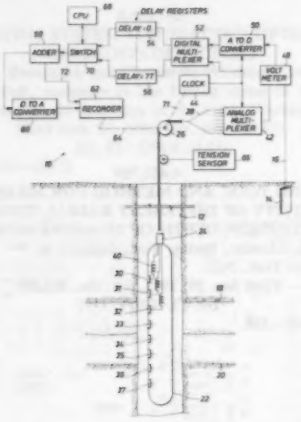
separate filter means associated with each of said mixing means for receiving the output of the mixing means and outputing a signal derived from one of the transmitting means and at a frequency common to the output of each of the separate filter means.

4,451,790

SPONTANEOUS POTENTIAL LOG APPARATUS WITH RANDOMLY OCCURRING NOISE CANCELLATION

Frank R. Bravenec, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 10, 1981, Ser. No. 319,842
Int. Cl.³ G01V *3/26, 3/34*
U.S. Cl. 324—351 **10 Claims**



1. Detection apparatus to be moved through a fluid filled well bore for testing the well bore as the well bore passes through a plurality of formations in the earth for spontaneous potential resulting from electrochemical potential differences in the formations relative to a reference electrode near the earth's surface, the apparatus comprising:

(a) multiple redundant spontaneous potential measurement electrodes aligned at known longitudinally spaced distances along a sonde and being adapted to traverse a well bore and being in electrical contact with the borehole fluid, each of said electrodes measuring a potential difference relative to the reference electrode of the spontaneous potential of the earth's formations along the well bore and generating an output signal representative thereof;

(b) signal processing means connected to said multiple spontaneous potential electrodes for receiving said output signals therefrom and for shifting signals therefrom to an alignment on a base such that a signal from a specific formation from a single spontaneous potential electrode is aligned with a signal from another spontaneous potential electrode for the same formation; and

(c) summing means provided with said shifted and aligned signals of said signal processing means for adding said shifted and aligned signals in a manner that reinforces signals from the specific formation from multiple spontaneous potential electrodes and substantially tends to cancel randomly occurring noise on individual ones of said output signals.

4,451,791

METHOD AND APPARATUS FOR ELECTRICALLY TESTING ELEMENTS OF MULTI-CELL BATTERIES

Stuart S. Ostroff, Abington, and William G. Bevan, Birdsboro, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Mar. 17, 1982, Ser. No. 359,014
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—434 **8 Claims**

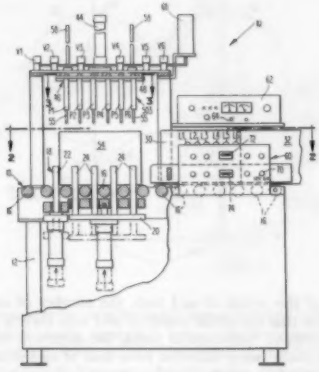
1. An apparatus for electrically testing individual elements of multi-cell batteries comprising:

means for individually locating multi-cell batteries at a selected test location, and

means for testing each element of each multi-cell battery when located at said test location for electrical leakage including

an array of probe means, at least one for each battery cell,

fault detector means having fault indicator means responsive to a detected fault,



means for advancing said array of probe means to a testing position such that each element of a battery positioned at said test location is engaged by one of said probe means,

means for sequentially associating individual ones of said probe means with said fault detector means thereby sequentially electrically testing the elements of the battery, and

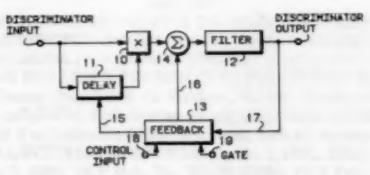
means for marking the battery to indentify individual faulty elements responsive to selected faults detected by said fault detector means.

4,451,792

AUTO-TUNED FREQUENCY DISCRIMINATOR

Michael J. Gay, Coppet, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 23, 1981, Ser. No. 314,162
Int. Cl.³ H03D *1/02, 1/18, 1/20*
U.S. Cl. 329—145 **12 Claims**



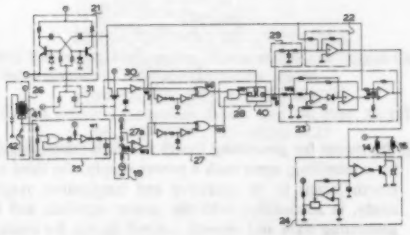
1. An auto-tuned frequency discriminator having an input and an output, the frequency discriminator being fully integrable on a signal integrated circuit and comprising: a multiplier circuit having a first input coupled to the input of the frequency discriminator, a second input, and an output which is proportional to the first input times the second input; a delay means having an input coupled to the input of the frequency discriminator, an output coupled to the second input of the multiplier circuit, and at least one control input, the delay means providing an output signal which is a delayed version of the delay means input signal, the amount of delay being variable in response to the at least one control input; a filter having an input coupled to the output of the multiplier circuit and an

output coupled to the output of the frequency discriminator such that high frequency components are filtered from the output of the frequency discriminator; a feedback means having an input coupled to the output of the filter and at least one output coupled to the at least one control input of the delay means so that the variable delay is responsive to the output of the filter; and a summing means having a first input coupled to the output of the multiplier, a second input, and an output coupled to the input of the filter, thereby coupling the output of the multiplier to the input of the filter; and the feedback means further including a second output coupled to the second input of the summing means.

4,451,793
CONTROL SYSTEM

Masaaki Ohgami, Musashino, and Fujio Matsui, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,374
Claims priority, application Japan, Aug. 2, 1979, 54-98855
Int. Cl.³ H03K *3/023, 5/08*
U.S. Cl. 328—69 **20 Claims**



1. A feedback control system comprising

a dither signal generating circuit means for producing a periodical dither signal having a pattern of pulses having a period which comprises a plurality of alternating positive excursions and negative excursions,

at least one of said positive excursions being lower than another of said positive excursions and at least one of said negative excursions being shallower than another of said negative excursions, said dither signal defining a center line having a level,

shift control circuit means for shifting the level of the center line of said dither signal so as to provide a shifted dither signal from time to time,

driving circuit means operatively connected to said shift control circuit means for producing a driving output depending on said dither signal,

actuator means operatively connected to said driving output for producing a controlled output,

output means including detecting means for sensing the controlled output and, means for distinguishing higher values of said controlled output from lower values of said controlled output, and providing an output signal, said higher values being higher than a desired value, said lower values being lower than said desired value,

comparing circuit means for comparing said output signal with reference pulses having the same period as that of corresponding of said pulses of said dither signal and for producing a control signal corresponding to said dither signal but said control signal omitting corresponding portions of the dither signal from time to time dependent on said output signal,

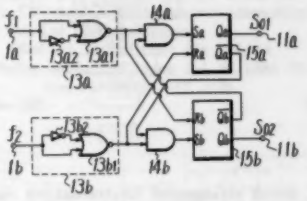
a shift signal generating circuit means for producing a shift signal dependent on said control signal for shifting the level of said center line of said dither signal from time to time via said shift control circuit means, and

amplitude control circuit means for decreasing the amplitude of said dither signal fed to said driving circuit means when said comparing circuit means produces said control signal such that the latter represents a position of said controlled output such that said desired value is between level-wise closest of said at least one of said positive excursions and of said at least one of said negative excursions respectively, whereby the amplitude of the controlled output is decreased.

4,451,794
PHASE COMPARATOR

Takaaki Yamada, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 363,030
Claims priority, application Japan, Apr. 2, 1981, 56-49846
Int. Cl.³ H03D *13/00*
U.S. Cl. 328—134 **14 Claims**



1. A phase comparator comprising: a first signal input terminal supplied with a reference signal;

a second signal input terminal supplied with an input signal to be compared with said reference signal;

a first trigger pulse oscillator having an input and an output, the input of which is connected to said first signal input terminal to produce a trigger pulse having a predetermined pulse width at its output;

a second trigger pulse oscillator having an input and an output, the input of which is connected to said second signal input terminal to produce a trigger pulse having a predetermined pulse width at its output;

a first gate circuit means having a pair of input terminals and an output terminal, one of the pair of input terminals of which is connected to the output of said first trigger pulse oscillator;

a second gate circuit means having a pair of input terminals and an output terminal, one of the pair of input terminals of which is connected to the output of said second trigger pulse oscillator;

a first bi-stable circuit means having set and reset signal input terminals, and non-inverted and inverted output terminals, the set signal input terminal of which is connected to the output terminal of said first gate circuit means;

a second bi-stable circuit means having set and reset signal input terminals, and non-inverted and inverted output terminals, the set signal input termnal of which is connected to the output terminal of said second gate circuit means;

a first gate control means connected between the inverted output terminal of said second bi-stable circuit means and the other of the pair of the input terminals of said first gate circuit means;

a second gate control means connected between the inverted output terminal of said first bi-stable circuit means and the other of the pair of the input terminals of said second gate circuit means;

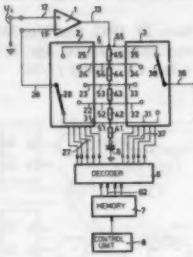
a first resetting means for supplying the reference signal of said first signal input terminal to the reset signal input terminal of said second bi-stable circuit means; and

a second resetting means for supplying the input signal of said second signal input terminal to the reset signal input terminal of said first bi-stable circuit means.

4,451,795
CIRCUIT ARRANGEMENT WITH CONTROLLABLE TRANSFER CHARACTERISTIC AT HIGHER FREQUENCIES

Ernst A. Kilian, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,159
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1980, 3037986
Int. Cl.³ H03F *1/34*; H03G *3/30*
U.S. Cl. 330—107 **9 Claims**



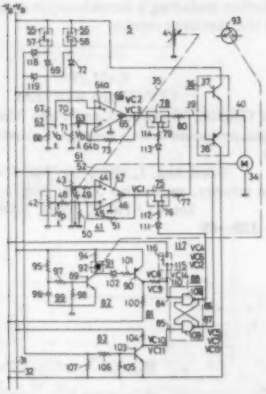
1. A circuit arrangement for transferring signals over a frequency spectrum having a low frequency end and a high frequency end and which includes means for adjusting its frequency transfer characteristic at the high frequency end comprising, an amplifier with variable frequency-dependent negative feedback and having an inverting and a non-inverting input, a signal input terminal coupled to the non-inverting input of said amplifier, a signal output terminal, an arrangement including a capacitor connected in series with a resistor chain voltage divider having a plurality of tappings, means connecting said series arrangement between an output of the amplifier and a point of reference voltage, a first switch which selectively couples said tappings on the resistor chain to the inverting input of the amplifier, and a second switch which selectively couples each of said tappings on the resistor chain to the signal output terminal independently of the setting of the first switch.

4,451,796
VOLUME CONTROL APPARATUS

Satoshi Yasumura, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,458
Claims priority, application Japan, Sep. 8, 1980, 55-127427[U]
Int. Cl.³ H03G *3/20*; H03F *21/00*
U.S. Cl. 330—127 **4 Claims**

1. A volume control apparatus comprising:
a manually operable presetting variable resistor;
first and second selectively operable manual switching means;
a motor for driving a volume control variable resistor;
a motor drive circuit for driving the motor;
a first means for generating a first control signal for controlling the motor drive circuit to drive the motor so that the volume control variable resistor may be set by the motor to a position corresponding to a preset position of the presetting variable resistor;
a second means for generating a second control signal for controlling the motor drive circuit to drive the motor so that during a selective operation of the first switching means, the volume control variable resistor may be operated by the motor in a first direction in response to the selective operation of the first switching means, and for generating a third control signal for controlling the motor drive circuit to drive the motor so that during a selective operation of the second switching means, the volume control variable resistor may be operated in a second direction in response to the selective operation of the second switching means;
a third means for supplying the motor drive circuit with the first control signal from the first means;
a fourth means for selectively supplying the motor drive circuit with the second and third control signals from the second means; and

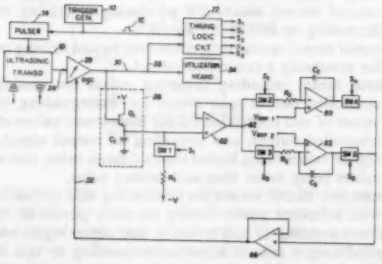


a fifth means for generating fourth and fifth control signals for controlling, upon each a power supply, the third and fourth means to be operative and inoperative, respectively, in accordance with the power supplied, and for generating sixth and seventh control signals for controlling, after the power supply, the third and fourth means to be inoperative and operative, respectively, in accordance with the selective operation of the first and second switching means.

4,451,797
AGC CONTROLLER FOR PULSED SYSTEM

James A. Bains, Jr., Pearland, Tex., assignor to AMF Inc., White Plains, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,829
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—134 **10 Claims**



1. Apparatus for controlling the gain of a controllable gain amplifier that has a signal input and an agc input to produce output signals having predetermined magnitudes in response to respective successively occurring input signals that recur in sequence, said apparatus comprising,
means for coupling said recurring successively occurring input signals to the signal input of said controllable gain

amplifier, said amplifier producing corresponding successively occurring output signals in response thereto,

means for providing a plurality of selectable agc loops for said amplifier,

means for sampling the magnitudes of desired ones of the successively occurring output signals during each recurrence of successively occurring output signals from the amplifier,

means responsive to said desired ones of the output signals from said amplifier for coupling each sampled output signals to a succession of signals to a respective one of the agc loops,

means in each of said loops for producing and holding an agc signal relating to the magnitude of the sampled signal coupled thereto,

means responsive to sampled amplifier output signals for coupling a respective one or more feedback loop to the agc input of said amplifier to provide an agc signal thereto that was produced by a desired signal of the previously received succession of signals that had the same relative position in the succession as the next to be received desired signal in the present succession, whereby said amplifier is properly conditioned to receive the next desired signal.

4,451,798

GAIN-CONTROLLED AMPLIFIER

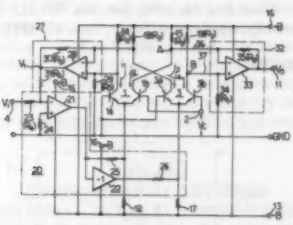
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 13, 1982, Ser. No. 408,130

Claims priority, application Japan, Aug. 14, 1981, 56-127543

Int. Cl.³ H03F *3/45;* H03G *3/20*

U.S. Cl. 330—254 **10 Claims**



1. A gain-controlled amplifier whose gain is controlled by a control voltage applied thereto comprising:

an input signal terminal for receiving an input signal;

a first bipolar transistor pair having first and second transistors of same conductivity types each transistor having a base, an emitter, and a collector, both emitters being joined together to form a first joined emitter;

a second bipolar transistor pair having third and fourth transistors of said same conductivity types each transistor having a base, an emitter, and a collector, both emitters being joined together to form a second joined emitter;

drive circuit means coupled between said input signal terminal and said first and second joined emitters for amplifying said input signal applied to said input signal terminal and driving said first and second joined emitters in opposite phase to each other;

first signal generating means for generating a first signal representing a current difference between collector currents of said first and third transistors;

second signal generating means for generating a second signal representing a current difference between collector currents of said second and fourth transistors;

negative feedback circuit means for negative-feeding back one of outputs of sad first and second signal generating means to an input side of said drive circuit means; and

output signal circuit means coupled to derive the other of outputs of said first and second signal generating means therefrom as an output signal of said gain-controlled amplifier;

said bases of said first and third transistors being joined together to form a first control voltage input terminal;

said bases of said second and fourth transistors being joined together to form a second control voltage input terminal;

said control voltage being applied across said first and second control voltage input terminals;

said first joined emitter being driven in an opposite phase in relation to said first signal from said negative feedback circuit means; and

said second joined emitter being driven in a same phase in relation to said first signal from said negative feedback circuit means.

4,451,799

B-CLASS COMPLEMENTARY CIRCUIT

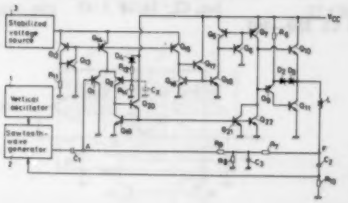
Osamu Fujita, Chigasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 24, 1981, Ser. No. 286,714

Claims priority, application Japan, Jul. 30, 1980, 55-105463

Int. Cl.³ H03F *3/45, 3/26*

U.S. Cl. 330—255 **7 Claims**



1. A B-class complementary circuit comprising an output stage of B-class complementary construction, a driving stage for driving said output stage and having a constant-current load circuit, and a predriving circuit including a differential amplifier, wherein:

said differential amplifier is connected to a reference voltage means by its first input terminal, to a sawtooth-wave voltage signal generator by its second input terminal and to an input end of said driving stage by its output terminal, said differential amplifier being fed with a constant current from a first current-mirror circuit controlled by a stabilized voltage source, and said constant-current load circuit is connected to a second current-mirror circuit which has the same construction as said first current-mirror circuit through at least one stage of a third current-mirror circuit, characterized in that

said first current-mirror circuit comprises an emitter-grounded primary transistor, an emitter-grounded secondary transistor, and a collector-grounded auxiliary transistor, said secondary transistor being connected to supply said constant current to said differential amplifier, and said auxiliary transistor being connected by its base to the collector of said primary transistor and by its emitter commonly to the base of said primary transistor and the base of said secondary transistor,

said second current-mirror circuit comprises said primary transistor and said auxiliary transistor of said first current-mirror circuit, and a second current-mirror emitter-grounded secondary transistor, which is connected by its base to the base of said primary transistor and the emitter of said auxiliary transistor,

said third current-mirror circuit stage comprises third current-mirror emitter-grounded primary transistor, which is collector-to-collector series-connected to said second current-mirror secondary transistor, a third current-mirror emitter-grounded secondary transistor and a third

current-mirror collector-grounded auxiliary transistor, which is connected by its base to the collector of said third current-mirror primary transistor and by its emitter commonly to the bases of said third current-mirror primary transistor and by its emitter commonly to the bases of said third current-mirror primary transistor and said third current-mirror secondary transistor, and

said driving stage comprises a driving stage emitter grounded primary transistor connected by its collector to said differential amplifier output terminal, driving stage emitter-grounded secondary transistors constituting active elements of said driving stage, and a driving stage collector-grounded auxiliary transistor, which is connected by its base to the collector of said driving stage primary transistor and by its emitter commonly to the bases of said driving stage primary transistor and said driving stage secondary transistors.

4,451,800

INPUT BIAS ADJUSTMENT CIRCUIT FOR AMPLIFIER

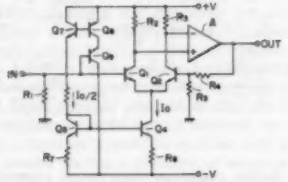
Akira Nishioka, and Yoshihiro Kawanabe, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,464

Claims priority, application Japan, Sep. 27, 1980, 55-134764

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **3 Claims**



1. In a feedback type amplifier circuit having a differential amplifier circuit including a pair of differential transistors of one conductivity type, an input bias adjustment circuit, comprising:

current means for producing a current having a predetermined ratio to DC currents flowing in said differential transistors;

a first transistor (Q_7) of said one conductivity type and connected in series with said current means, said first transistor having a base;

a second transistor (Q_8) of opposite conductivity type from said first transistor and having a base coupled to said first transistor base in such a way that said first and second transistors have equal base currents; and

a third transistor (Q_9) of said opposite conductivity type and coupled in series with said second transistor, the base current of said third transistor being coupled to a base of at least one of said differential transistors.

4,451,801

WIDEBAND LINEAR CARRIER CURRENT AMPLIFIER

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1981, Ser. No. 295,905

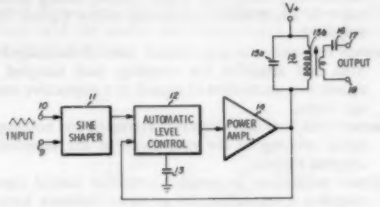
Int. Cl.³ H03F *3/20*; H04M *11/04*

U.S. Cl. 330—278 **9 Claims**

1. An amplifier circuit for supplying a carrier current signal to an AC power line, said circuit comprising:

a high gain current amplifier having an input, an output and a current gain n, wherein said amplifier has one stage of phase inversion, between its input and an output thereof, a series resistor in said output and a shunt resistor coupled between said output and said input to provide negative feedback;

an output circuit for coupling said amplifier output to said AC power line; and



an automatic level control section responsive to the level of signal at said output and coupled to said amplifier input so that said level of signal is maintained constant.

4,451,802

POWER AMPLIFIER

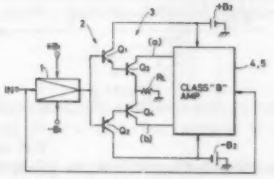
Hiroshi Koinuma, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,311

Claims priority, application Japan, Jun. 17, 1981, 56-93613

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—297 **5 Claims**



1. A power amplifier comprising:

a class A power amplifier circuit including a pair of power amplifying elements having power supply terminals and output terminals wherein said power amplifying elements drive a load connected to said output terminals in response to control signals, amplifying elements serving as drivers for said power amplifying elements wherein said amplifying elements provide said control signals to said power amplifying elements, a voltage source connected between said power supply terminals of said power amplifying elements, and a voltage amplifying stage for receiving an input signal and for supplying an amplified output signal to said amplifying elements, said amplifying elements providing said control signals to said power amplifying elements in accordance with said amplified output signal;

a class B amplifier circuit drivable by said input signal supplied to said voltage amplifying stage and including a pair of output amplifying elements arranged in a push-pull connection and having at least one output connected to said voltage source; and

a power supply connected to supply operating power to said output amplifying elements and to said amplifying elements.

4,451,803

SPLIT TUNING FILTER

Timothy M. Holdsworth, Clay; Joseph P. Hesler, Liverpool, and George W. DuBois, Mexico, all of N.Y., assignors to Eagle Comtronics, Inc., Clay, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,245
Int. Cl.³ H03H 7/01, 1/00
U.S. Cl. 333—12 22 Claims

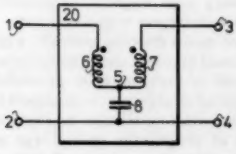
1. An electrical signal filter comprising:
a single component circuit board for mounting and electrically interconnecting electrical filter components on at least one of an upper and lower surface thereof;
a first filter section formed by electrical filter components and provided on a first area of said single circuit board;
a second filter section formed by electrical filter components and provided on a second area of said circuit board, said first and second filter sections being electrically interconnected by a conductor and said first and second filter sections being spaced from one another to form an isolation area through which said conductor passes;
a metallic container which receives said single circuit board to form a housing about said circuit board; and
a pair of metallic members attached to said circuit board and spaced by a predetermined amount at positions on opposite sides of said isolation area, each of said metallic structures being constructed and arranged to form a guide for positioning and mounting said single circuit board within said metallic container such as to form a first cavity enclosing said first filter section, a second cavity enclosing said second filter section, and a third cavity defining said isolation area which separates said first and second cavity.

4,451,804

FOUR-TERMINAL NETWORK

György Veisz, Raday u. 34, Eng. El., Budapest IX; Gábor Dávid, Holdvilag u. 1., Budapest XI; Peter Kòszeghy, Damjanich u. 27/a., Budapest VII, and Lajos Szekely, Bajcsy-Zsilinszky ut 21., Budapest VI, all of Hungary

Filed May 3, 1982, Ser. No. 374,200
Claims priority, application Hungary, Sep. 1, 1981, 2517/81
Int. Cl.³ H03H 7/09
U.S. Cl. 333—177 7 Claims



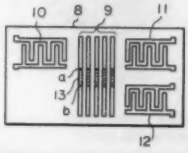
1. A four-terminal network, comprising:
a first input terminal;
a second input terminal;
a first output terminal;
a second output terminal connected to said first input terminal at an intermediate point;
a first inductance winding having one end connected to said first input terminal, an opposite end and a plurality of turns for conducting current;
a second inductance winding having one end connected to said first output terminal, an opposite end connected to said opposite end of said first inductance winding at a common point, and a plurality of turns; and
a condenser connected between said common point and said intermediate point;
said first and second inductance windings being selected to have substantially identical inductance, to be disposed clearly adjacent each other with each turn of said first inductance winding being adjacent a respective turn of said second inductance winding, said turns of said first and second inductance windings being disposed so that current flows in said first inductance winding in a direction opposite to the direction in which current flows in said second inductance winding, and said first and second inductance windings extending parallel to each other.

4,451,805

SURFACE ACOUSTIC WAVE FILTER

Masaaki Ono; Yoshiro Fujiwara, and Masanobu Yanagisawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 23, 1982, Ser. No. 371,502
Claims priority, application Japan, Apr. 28, 1981, 56-60654[U]
Int. Cl.³ H03H 9/76, 9/64, 9/145
U.S. Cl. 333—195 17 Claims



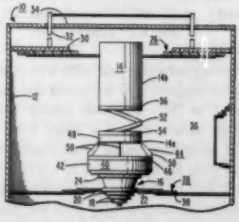
1. A surface acoustic wave filter comprising:
a substrate of a piezoelectric material;
a multistrip coupler, formed on said substrate and having first and second sides, comprising a plurality of parallel conductive strips each of which has a middle portion made of a photoconductive material;
at least one input transducer formed on said first side of said multistrip coupler; and
at least one output transducer formed on said second side of said multistrip coupler.

4,451,806

TUNING MEANS FOR A TRANSMISSON LINE CAVITY

Claude E. Doner, New Providence, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,664
Int. Cl.³ H01P 7/04
U.S. Cl. 333—224 6 Claims



1. In a transmission line cavity comprising an outer conductor and a hollow cylindrical center conductor, said cavity

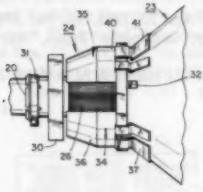
being in combination with an excitation means for establishing electromagnetic waves within said cavity, the improvement wherein said center conductor has a discontinuity therein, said discontinuity being bridged by at least one discrete conductive member to provide an incrementally variable series inductance for changing the resonant frequency of said cavity and to provide a current carrying path along said center conductor.

4,451,807

TELEVISION RASTER PINCUSHION DISTORTION CORRECTION DEVICE

Kenneth W. McGlashan, Indianapolis, and John R. Archer, Carmel, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,832
Int. Cl.³ H01F 3/12
U.S. Cl. 335—211 **10 Claims**



1. A deflection yoke comprising:
a magnetically permeable core;
a pair of deflection coils toroidally wound on said core and adapted for coupling to a source of deflection signals for producing a deflection field encircled by said core and producing a stray field external to said core; and
field shaping apparatus comprising:
magnetically permeable flux directing means disposed at the front of said yoke for forming an electromagnetic field at the front of said yoke for influencing the movement of an electron beam;
magnetically permeable flux gathering means located within said stray field and coupled to said flux directing means, said flux gathering means extending along substantially the entire length of said deflection coils and encircling a significant portion of said coils.

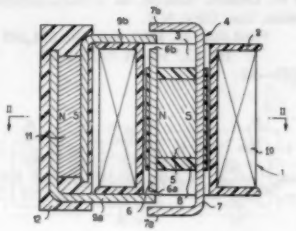
4,451,808

ELECTROMAGNET EQUIPPED WITH A MOVING SYSTEM INCLUDING A PERMANENT MAGNET AND DESIGNED FOR MONOSTABLE OPERATION

Gerard Koehler, Ville d'Avray, France, assignor to La Telemecanique Electrique, Nanterre Cedex, France

Filed Jan. 18, 1983, Ser. No. 458,907
Claims priority, application France, Jan. 20, 1982, 82 00792
Int. Cl.³ H01F 7/08
U.S. Cl. 335—229 **19 Claims**

1. An electromagnet equipped with a moving system including a permanent magnet and designed for monostable operation, comprising at least one coil which partly surrounds a magnetic circuit consisting of a fixed yoke and a movable armature, said armature being constituted by a permanent magnet having pole faces adapted to carry pole-pieces which project on each side of the axis of magnetization of the magnet so as to constitute in conjunction with the end portions of the fixed yoke two air-gap zones in which magnetic forces are developed and tend to displace the armature to either of its two end positions according as the coil is energized in a suitable direction or is not energized, wherein said electromagnet comprises a second permanent magnet interposed within the fixed yoke with a polarity such that said armature is urged towards



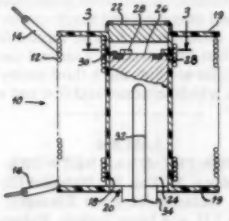
the end or so-called rest position when the coil is not energized.

4,451,809

ELECTROMAGNETIC DEVICE

Keith E. Zukausky, Hanover, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 8, 1982, Ser. No. 355,833
Int. Cl.³ H01F 7/08
U.S. Cl. 335—255 **12 Claims**

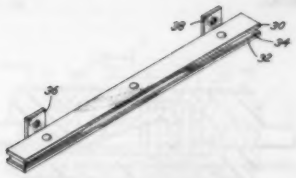


1. An electromagnetic actuator comprising:
(a) coil means defining one or more turns of conductor material having a relatively high electrical conductivity;
(b) pole piece means including a member formed of material of relatively high magnetic permeability and disposed centrally with respect to said coil turn;
(c) armature means disposed centrally with respect to said coil turn, said armature means including a member formed of material of high magnetic permeability disposed in axially spaced arrangement with respect to said pole piece means, and armature member having provided thereon a plurality of peripherally spaced lugs extending axially therefrom about the periphery thereof, with the area of the lugs in a direction transverse to the longitudinal dimension of the armature being small with respect to the transverse section area of the armature such that, upon a desired current flowing through said coil means, said lugs become magnetically saturated and,
(d) upon flowing an alternating electrical current through said coil means, a force is applied to said armature means causing said armature member to move toward said pole piece means until further movement thereof is arrested by said lugs contacting said pole piece means thereby preventing rocketing or orbiting.

4,451,810
MAGNETIC TOOL HOLDER

Merrill R. Miller, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Feb. 7, 1983, Ser. No. 464,407
Int. Cl.³ H01F 7/20
U.S. Cl. 335—285 2 Claims



1. An improved magnetic tool holder comprising, in combination:

a pair of equally sized, generally rectangular, metal plates;

a single magnetic bar having longitudinal and width dimensions slightly less than the corresponding dimensions of the plates, said bar comprised of a flexible material impregnated with a magnetic powder material;

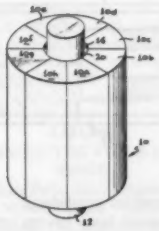
at least two L-shaped bracket members having a support leg longer than the cumulative thickness of the plates and bar and a fastening leg having a length slightly less than the width of the plates; and

at least two fasteners connected entirely through a series of aligned openings in an assembly stack of the plates with the bar therebetween and the fastening leg against one plate and with the support leg positioned against the longitudinal aligned edges of the plates and bar, each support leg spaced laterally from the other, each support leg extending transversely from the assembly stack and including an opening for attachment and support of the holder, one fastener being associated with each bracket member to maintain the holder in assembled condition.

4,451,811
MAGNET STRUCTURE

George J. Hoffman, Malibu, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 62,197, Jul. 30, 1979, abandoned, and Ser. No. 209,628, Nov. 24, 1980. This application Sep. 27, 1982, Ser. No. 424,570
Int. Cl.³ H01F 7/02
U.S. Cl. 335—302 4 Claims



1. A permanent magnet comprising:

a two-poled permanent magnet structure having a circularly cylindrical bore therethrough, the interior of said bore forming one of said poles, said bore having an axis of symmetry;

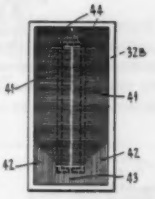
said structure being divided circumferentially of said bore into a plurality of substantially contacting circumferential segments each having an inner surface which is a circumferential segment of the cylindrical surface of said bore;

all of said segments being magnetized along their entire length and about the entire portions of said circumference with their internal magnetizations identically poled in a radical direction relative to said axis and their pole strengths to be substantially equal, to cause substantially the entire surface of said circumferential segments of said bore to become identically and substantially uniformly poled magnetic pole faces of said segments.

4,451,812
ELECTROSTATIC SHIELD

Valentino F. Vescovi, Macleod, and Arthur W. Richards, Plenty, both of Australia, assignors to Sphere Investments Limited, Nassau, The Bahamas

Continuation of Ser. No. 154,295, May 29, 1980, abandoned. This application Apr. 27, 1982, Ser. No. 372,371
Claims priority, application South Africa, Jun. 19, 1979, 79/3030
Int. Cl.³ H01F 15/04
U.S. Cl. 336—84 C 4 Claims



1. An electrostatically shielded conductor unit comprising an electrically insulating plate having a first face and an opposite face, a coil having a longitudinal axis and formed in a path of generally rectangular configuration in the plane of said first face formed on said first face by a printed circuit technique, the longitudinal axis extending along the coil and following the rectangular configuration, an electrostatic shield in the form of a sheet-like array of closely spaced elongate conductors disposed so that where elongate conductors cross the coil, they all do so at right angles to the longitudinal axis thereof, said conductors being formed on said opposite face of said plate by a printed circuit technique, and means for connecting the elongate conductors to a common potential.

4,451,813
VACUUM FUSE HAVING MAGNETIC FLUX GENERATING MEANS FOR MOVING ARC

Kengo Hirose, and Norio Kudo, both of Tokyo, Japan, assignors to Japan Radio Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 272,208, Jun. 10, 1981, abandoned, which is a continuation of Ser. No. 70,412, Aug. 28, 1979, abandoned. This application Feb. 22, 1983, Ser. No. 468,677
Int. Cl.³ H01H 85/38
U.S. Cl. 337—17 18 Claims

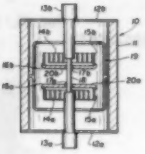
1. In a vacuum fuse comprising a sealed evacuated dielectric housing, first and second electrically conductive members fixedly supported by and through the dielectric housing and arranged so that inner ends of said first and second conductive members confront one another to form a predetermined fixed space therebetween, first and second arcing electrode means disposed at respective inner ends of said first and second conductive members to define a fixed gap between entirely continuous, non-interrupted annular confronting surfaces thereof, said first and second arcing electrode means being electrically connected with respective first and second conductive members, and an electrically conductive fusible element means connected between said first and second conductive members

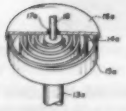
and bridging said fixed gap between said first and second arcing electrode means,

the improvement which comprises in combination:

said confronting surfaces of said first and second arcing electrode means each being substantially flat;

at least one coil means having an inner connecting end and an outer connecting end, said coil means being mounted on the inner end of at least said first electrically conductive member, said inner connecting end of said coil means being electrically connected to said first electrically conductive member and said outer connecting end thereof being electrically connected to a peripheral edge of the confronting surface of said first arcing electrode means, said at least one coil means forming said electrical connection between said first arcing electrode means and said first electrically conductive member and supporting said first arcing electrode means, said coil means being formed so that magnetic flux is produced in said fixed gap by arc current flowing through said at least one coil means when





an arc is produced between the confronting surfaces of said first and second arcing electrode means at a time when said fusible element means melts, said magnetic flux being sufficient to cause said arc to move toward and extinguish at said peripheral edge as said arc is confined solely within said fixed gap between said entirely continuous substantially flat annular confronting surfaces, and

said first arcing electrode means having a substantially central hole in the entirely continuous annular confronting surface thereof through which hole said fusible element means extends without contacting said first arcing electrode means to connect directly with said first conductive member, so that current flow through said at least one coil means is prevented before said fusible element means melts, and said arc current is directed to the peripheral edge of the confronting surface of said first arcing electrode means through said at least one coil means at a time when said fusible element means melts to produce an arc between said entirely continuous substantially flat annular confronting surfaces.

4,451,814

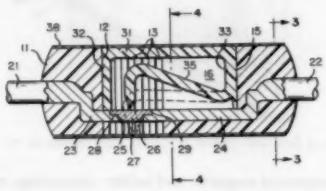
NON-RESETTABLE THERMAL FUSE

Leon G. Barry, and Willis E. Rieman, both of Shelby, N.C., assignors to Fasco Controls Corporation, Shelby, N.C.

Filed Jun. 14, 1982, Ser. No. 387,968
Int. Cl.³ H01H *37/76*
U.S. Cl. 337—407 **9 Claims**

1. A thermal fuse, comprising a dielectric housing having therein a sealed chamber, a pair of spaced wire leads projecting from opposite ends, respectively, of said housing, a fusible metal alloy link positioned in said chamber and operative normally to form at least part of an electrical connection between said pair of leads, a flexible, preloaded spring element engaged with said link normally to exert a predetermined stress thereon, and operative, when the ambient temperature of said link exceeds a predetermined temperature range, suddenly to interrupt said electrical connection between said leads, said spring element being a sinuous metal wire fixed at one end to one of said leads, and releasably secured under tension at its opposite end to a stationary surface in said chamber by said link, and in electrical connection with the other of said leads,

a metal cover secured over an opening in one end of said chamber,



said alloy link being secured to the inside of said cover to face said chamber and said other lead is secured to the outside of said cover, and

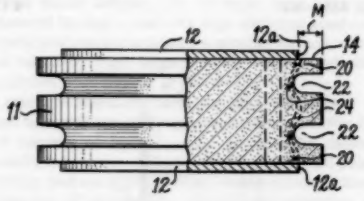
said sinuous metal wire being integral at said one end thereof with said one lead, and having said opposite end thereof embedded in said alloy link to be held in tension thereby until the ambient temperature of said link exceeds said predetermined temperature range.

4,451,815

ZINC OXIDE VARISTOR HAVING REDUCED EDGE CURRENT DENSITY

Eugene C. Sakshaug, Lanesborough, and James S. Kresge, Pittsfield, both of Mass., assignors to General Electric Company, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,908
Int. Cl.³ H01C *7/12*
U.S. Cl. 338—21 **6 Claims**



1. A zinc oxide varistor comprising:

a disc-shaped sintered body having opposed faces and circumferential rim;

an electrode applied to each said face, the edges of said electrodes being spaced from the edges of said body to leave circumferential marginal portions of said faces devoid of electrode material; and

at least one circumferential groove created in said rim, the depth of said groove being approximately equal to the width of said electrode-free marginal face portions.

4,451,816
GAS MONITOR

Geoffrey W. Ball, Apple Patch, Bellingdon, Chesham, Buckinghamshire, England

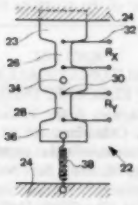
Filed Dec. 31, 1981, Ser. No. 336,403
Claims priority, application United Kingdom, Dec. 31, 1980, 8041552
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 9 Claims

1. A gas monitor comprising:
a tape having a base carrying a layer of gas absorbant material capable of recording magnetic signals,
both the base and the layer of gas absorbant material being capable of being heated to a temperature at which any gas absorbed by the gas absorbant material is driven off without being damaged.

4,451,817
DYNAMOMETER TRANSDUCER UTILIZING AN AMORPHOUS METAL

Hans-Rudolf Zulliger, Uetikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed Sep. 27, 1982, Ser. No. 424,056
Claims priority, application Switzerland, Mar. 25, 1982, 1830/82
Int. Cl.³ H01L 10/10
U.S. Cl. 338—47 6 Claims



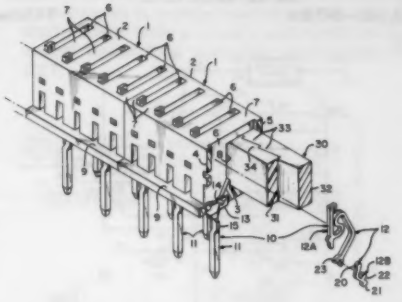
1. In transducing apparatus having a member having a load-dependent deformation, and means for generating an electrical signal in response to said deformation, the improvement comprising
a band-shaped measuring element made of amorphous metal constituting said member, said band-shaped measuring element having a length varying as a function of load applied thereto, said change in length constituting said load dependent deformation.

4,451,818
MINIATURE CONNECTOR FOR A CIRCUIT BOARD EDGE

Dimitry Grabbe, Lisbon Falls, Me.; Johannes C. W. Bakermans, Harrisburg, Pa.; Nicola Cosmo, Harrisburg, Pa., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 6, 1982, Ser. No. 395,387
Int. Cl.³ H07R 9/09
U.S. Cl. 339—75 MP 10 Claims

1. A miniature circuit board edge connector assembly comprises an insulative housing, conductive posts projecting from the housing, spring contacts received by the housing and connected with the posts and adapted for resilient flexure toward corresponding circuit conductors on a circuit board that is received by the housing, and a moveable cam received by the housing and adapted for flexing resiliently the spring contacts, characterized in that; the spring contacts include conductor portions, pivot connections between the conductor portions and corresponding posts and the conductor portions being

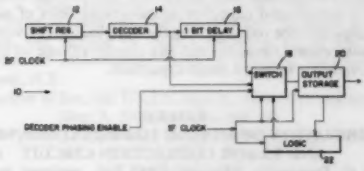


pivotal about the pivot connections toward and into engagement with corresponding circuit conductors, and circuit paths are established along the conductor portions from the circuit conductors to corresponding posts, the circuit paths being shorter than the lengths of the spring contacts.

4,451,819
METHOD AND APPARATUS FOR DECODING BINARY DATA

Robert L. Beckenhauer, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jun. 22, 1981, Ser. No. 275,682
Int. Cl.³ H03K 13/24
U.S. Cl. 340—347 DD 12 Claims



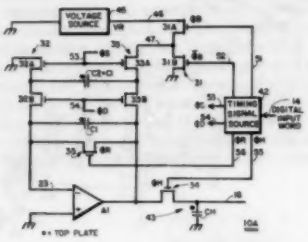
1. A method of converting input data bit signals representative of binary data in one form entering an apparatus at a first fixed rate to output bit signals representative of the same data in another form exiting said apparatus at a second fixed rate according to a code, wherein according to said code there are more bit signals of the data in said one form than the bit signals of the same data in said another form, said method comprising:
inputting a stream of known input bit signals into a register means of said apparatus;
decoding said known input bit signals into output bit signals and storing them in an output means;
comparing the decoded output bit signals to anticipated output bit signals that correspond to the binary data of the known input bit signals according to said code;
selecting a predetermined delay to be inserted in the path from said register means to said output means such that the decoded output bit signals are in phase with the anticipated output bit signals, and then applying the input data bit signals to said register means whereby the inserted delay will then cause properly decoded output data bit signals to be stored in said output means.

4,451,820

CHARGE REDISTRIBUTION INTEGRATABLE D/A CONVERTOR

Christopher W. Kapral, San Carlos, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Aug. 27, 1981, Ser. No. 296,733
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



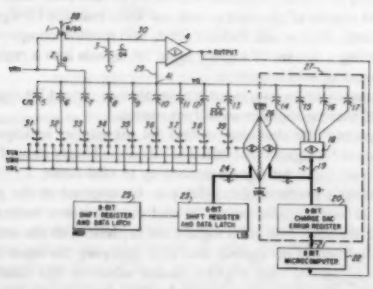
1. An integratable digital to analog converter comprising:
first and second capacitors having capacitances of the same values, and having one and other sides thereof;
a differential input operational amplifier means having an inverting input terminal and an output terminal electrically connected to one and other sides, respectively, of said first capacitor and having a non-inverting input electrically connected to ground for impressing a virtual ground potential on said inverting input terminal;
first switch means sequentially responsive to each binary bit in a digital input word for impressing onto a first bus line one of a prescribed voltage from a voltage source and the ground reference voltage which may correspond to a binary one and zero in the associated bit position; and
second switch means operative for each bit cycle of the digital input word in said first switch means for first connecting said one and other sides of said second capacitor to ground and said bus line, respectively, for sampling the bus voltage, and then connecting said one and other sides of said second capacitor to associated sides of said first capacitor for redistributing the sampled charge-voltage on said second capacitor and any charge-voltage on said first capacitor between these capacitors.

4,451,821

COMBINATION OF ANALOG TO DIGITAL CONVERTER AND ERROR CORRECTION CIRCUIT

John C. Domogalla, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1981, Ser. No. 317,716
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**


OUTPUT
9-BIT SHIFT REGISTER AND DATA LATCH
9-BIT SHIFT REGISTER AND DATA LATCH
9-BIT CHARGE DAC ERROR REGISTER
9-BIT MICROCOMPUTER

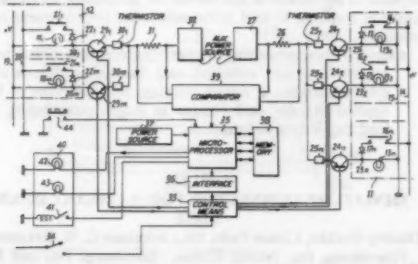
1. In a combination of an analog to digital converter having a comparator means with a first and second terminal for comparing signals on the first terminal to signals on the second terminal—first and second reference terminal means for providing a first and second reference signal to the analog to digital converter—an analog input means for receiving an analog signal for conversion to a digital signal—a plurality of capacitors means connected in a capacitor array each with a first and second side the first side being connected to a node—the plurality of capacitors having the first side connected together and to the first terminal, for redistributing of charge representative of the analog signal—sampling switch means for obtaining a digital representation of the analog signals, and includes; a first switch means for selectively connecting and disconnecting the reference terminal means to the second terminal, a second switch means for selectively connecting and disconnecting the reference terminal means to the first side of the capacitor array, a third switch means for selectively connecting and disconnecting each second side of the plurality of capacitors between the reference terminal means and the analog input means, and switch control means for controlling the selective connection and disconnection of the first, second and third switch means to the reference terminal, disconnecting the first and second switch means from the reference terminal and connecting the third switch means from the reference terminal means to the analog input means and an error corrector means for compensating for anomalies in each member of the plurality of capacitors, the error correction means comprises
reference capacitor connected to the second terminal;
supplemental charge circuitry means connected in parallel to the capacitor array for adjusting the charge stored in the capacitor array;
error control means for controlling of the adjustment of the charge stored in the capacitor array; and
register means for retaining the charge adjustment of each member capacitor of the plurality of capacitors.

4,451,822

DEVICE FOR AUTOMATICALLY CHECKING A PLURALITY OF ELECTRIC INDICATOR LIGHTS

Bernard P. Verse, Blagnac; Alain Y. Geoffroy, Tournefeuille, and Pierre Gentet, Colomiers, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Aug. 26, 1981, Ser. No. 296,365
Claims priority, application France, Sep. 17, 1980, 80 19997
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—642 **9 Claims**



1. A device for checking a plurality of electric indicator lights connected in a plurality of parallel circuits across a common power supply, each circuit including one of said lights in series with a diode, said device comprising:
a plurality of controlled switches each of which has one side adapted to be connected to one of said circuits at a point between said light and said diode;
an auxiliary power source having a plurality of outputs, each output being connected to the other side of one of said

switches in a circuit including the light associated with said one switch;

control means for sequentially actuating said controlled switches;

current measuring means for measuring the current flowing through each of said lights when its associated switch is closed to complete a circuit therethrough; and

comparison means responsive to said current measuring means for comparing said measured current with a predetermined reference current corresponding to normal functioning of each said lamp.

4,451,823

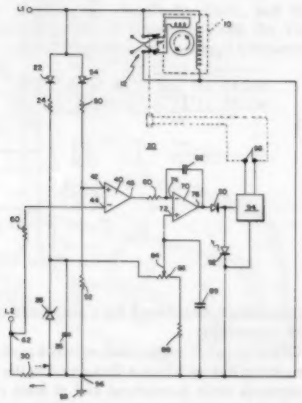
OVERLOAD SENSING CIRCUIT FOR A MOTOR

Paul E. Penn, and John W. Waymire, both of Indianapolis, Ind., assignors to Dart Controls, Inc., Zionsville, Ind.

Filed Aug. 7, 1981, Ser. No. 290,817

Int. Cl.³ G08B 21/00

U.S. Cl. 340—648 **12 Claims**



1. In combination with an electric motor, an alternating signal source for driving the motor and supply lines connecting the motor to the signal source, a circuit for sensing an overload condition of the motor comprising means for providing a voltage signal indicative of changes in the motor current, means for measuring the phase relationship between the signal source voltage and the voltage signal indicative of motor current, the measuring means providing an output signal having first and second levels wherein the relative time durations of the first and second signal levels correspond to the phase relationship between the signal source voltage and the voltage signal indicative of motor current, means for selecting a reference phase relationship indicative of a load limit for the motor, and means for comparing the output signal to the reference phase relationship and for providing a signal to indicate an overload condition of the motor when the reference phase relationship is greater than the measured phase relationship.

4,451,824

COLOR CONVERGENCE DATA PROCESSING IN A CRT COLOR DISPLAY STATION

David J. Thayer, Elgin; James J. Krause, Hanover Park, and John R. Welk, Addison, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 21, 1982, Ser. No. 390,580

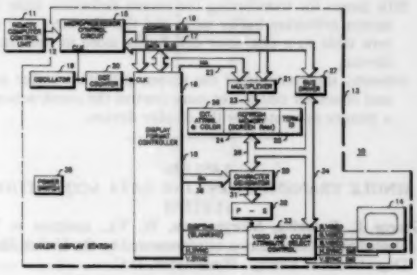
Int. Cl.³ G09G 1/00

U.S. Cl. 340—720 **16 Claims**

1. In a CRT information display system in which a CRT display station receives electrical convergence control signals from a control unit, effectively stores them and then allows the reading back of the stored convergence control signals, and in which a screen display RAM is provided for receiving and storing video character control signals which define a video character pattern to be visually displayed, the improvement comprising said display station including the combination of:

a preconverged CRT on which a video character pattern is to be displayed,

means for receiving and storing said electrical convergence control signals in predetermined storage locations in said display station while preventing said stored convergence control signals from controlling convergence of said CRT,



means for receiving and storing said video character control signals in predetermined storage locations in said screen RAM, and

means for providing a predetermined visually displayed character pattern on said CRT in accordance with said stored video character control signals in said screen RAM while effectively preventing said stored convergence control signals from controlling convergence of said CRT.

4,451,825

DIGITAL DATA DISPLAY SYSTEM

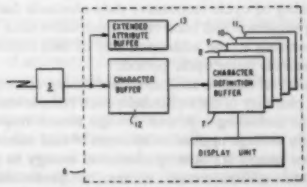
Stephen T. Hall, Eastleigh; Raymond Hardiman, Chandlers Ford; Peter W. Johnson, Winchester; Peter Quarendon, Brushfield, and Harold W. Tuffill, Littleton, all of England, assignors to International Business Machine Corporation, Armonk, N.Y.

Continuation of Ser. No. 189,526, Sep. 22, 1980. This application Dec. 9, 1982, Ser. No. 448,159

Claims priority, application United Kingdom, Sep. 27, 1979, 7933533

Int. Cl.³ G09G 1/16

U.S. Cl. 340—750 **9 Claims**



1. A digital data display system for presenting a graphical picture on an output device in which the area or screen from which the picture is to be viewed is notionally divided into a plurality of character cells each of which comprises a predetermined number of picture elements (pels), the system comprising

first means for creating, in response to input information, a first level description of all the elements of a picture to be presented,

second means for storing a screen definition table having an entry for each character cell of the display area,

third means for calculating for each element of the picture, the pattern of pels in associated character cells required to display the elements, storing the calculated pattern in a table in a character cell store and associating the respective entry in the screen definition table with the required pattern in the character cell store,

fourth means to determine when a particular character cell pattern has already been calculated as required for a picture and to associate the respective screen definition table entries with only one copy of the particular character cell pattern, and

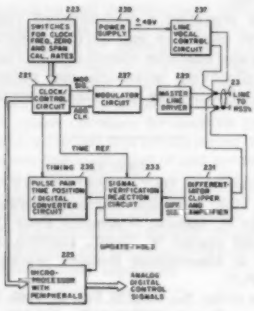
fifth means for transferring the screen definition table to a screen definition buffer store and the character cell pattern table to a character cell buffer store in the display device,

whereby the contents of the screen definition buffer store and character cell buffer store control the construction of a picture presented by the display device.

4,451,826
SINGLE TRANSMISSION LINE DATA ACQUISITION SYSTEM

George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,674
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.07 **4 Claims**



1. A single transmission line multiple channel data acquisition system, comprising:

a master station means for generating address pulses at a selected frequency for separately sequentially addressing a plurality of cycle responsive data channels during a scanning sequence and receiving quantitative data values corresponding to the addressed one of said channels during an address pulse cycle period;

a plurality of remote station/sensor means corresponding to said plurality of data channels, each remote station/sensor means including a power storage means responsive to a supply voltage applied to an input of said remote station/-sensor means for storing electrical energy to power said remote station/sensor means, a presettable address counter means for counting said address pulses received at said input thereof to determine when the channel is addressed in accordance with a preselected count of said address pulses and transmitting circuit means for measuring and transmitting the addressed channel quantitative data value in the form of a pulse position coded signal at an output of said remote station/sensor means;

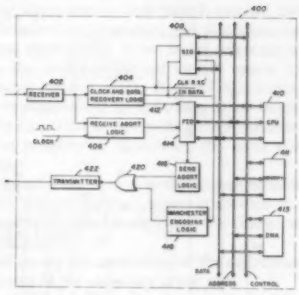
a transmission line connected between said master station and the input and output of each of said plurality of remote station/sensor means for transmitting said address pulses to each of said plurality of remote station/sensor means and said pulse position coded signals from each of said plurality of remote station/sensor means to said master station means; and

means for automatically maintaining a constant supply voltage on said transmission line for charging each power storage means of each of said remote station/sensor means independent of the number of said plurality of remote station/sensor means.

4,451,827
LOCAL AREA COMMUNICATION NETWORK

Steven A. Kahn, Silver Spring; Robert L. Stewart, Wheaton, and Stephen G. Tolchin, Rockville, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Sep. 22, 1981, Ser. No. 304,636
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.52 **27 Claims**



1. A communications network for a distributed data processing system comprising:

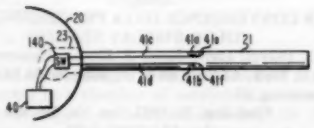
a plurality of network nodes, each network node comprising an incoming link on which a data signal to the corresponding network node is received and at least one network node further comprising an outgoing link on which a data signal from the at least one network node is transmitted; and

means, interposed between the network nodes, for coupling the outgoing link of a network node to the incoming links of only all the other network nodes, such that a data signal on an outgoing link of a particular network node does not enter the incoming link of the particular network node.

4,451,828
LINEARITY ADJUSTMENT OF SPACECRAFT TUBULAR SPAR-TYPE MEMBERS

William V. Fuldner, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,738
Int. Cl.³ H01Q *1/28, 1/08*
U.S. Cl. 343—872 **18 Claims**



1. An apparatus for preventing distortion of a spar-type member extending outwardly from an orbiting spacecraft due to unequal heat application from an external source, said apparatus comprising:

two electrically resistive strip heating elements attached to said member, said two elements positioned at opposite sides of the cross-section of said member;

means for sensing the temperature of said member at points adjacent each of said elements; and

means responsive to said temperature sensing means for providing an electric current to a selected one of said elements when a temperature difference between said points is sensed, to thereby equalize the temperature of said member at points adjacent said elements.

4,451,829

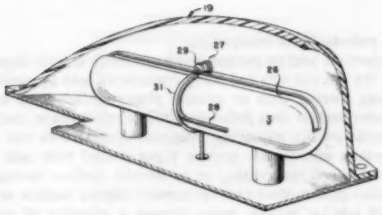
CIRCULARLY POLARIZED ANTENNA FORMED OF A SLOTTED CYLINDRICAL DIPOLE

Clarence W. Stuckey, Jr., Sepulveda, Calif., and Robert A. Meyers, deceased, late of Riverside, Calif. (by Carol Mae Meyers, executrix), assignors to Lockheed Corporation, Burbank, Calif.

Filed Jun. 25, 1979, Ser. No. 51,370

Int. Cl.³ H01Q *1/28, 13/12, 21/29*

U.S. Cl. 343—705 **12 Claims**



1. An antenna comprising:

a hollow conductive cylinder;

conductive walls enclosing the ends of said cylinder;

means defining a narrow longitudinal slot extending along the length of said cylinder;

means for electrically coupling a first transmission line directly across said slot; and,

means for electrically coupling a second transmission line across the midpoint of the longitudinal axis of said cylinder whereby said cylinder functions as a dipole.

4,451,830

VHF OMNI-RANGE NAVIGATION SYSTEM ANTENNA

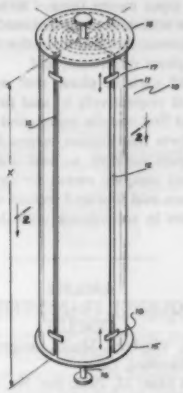
James G. Lucas, Wahroonga; Alan C. Young, West Pennant Hills, and Paul M. Hinds, Newtown, all of Australia, assignors to The Commonwealth of Australia, Australia

Filed Jul. 6, 1981, Ser. No. 280,180

Claims priority, application Australia, Dec. 17, 1980, PE6964

Int. Cl.³ H01Q *13/12, 13/18*

U.S. Cl. 343—768 **13 Claims**

1. A VOR antenna comprising a cylinder having four orthogonally disposed slots formed within the peripheral wall thereof, the slots extending in the direction of the longitudinal axis of the cylinder and being spaced-apart around the periphery of the cylinder, each slot being backed by a separate cavity which has a depth extending into the cylinder from the slot, the depth of each cavity being effectively greater than the radial

dimension of the cylinder, and the cavities being configured to locate wholly within the cylinder.

4,451,831

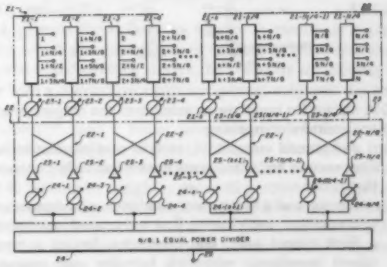
CIRCULAR ARRAY SCANNING NETWORK

John J. Stangel, Mahopac; John C. Herper, Glen Cove, and Carl Rothenberg, North Bellmore, all of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,252

Int. Cl.³ H01Q *3/40*

U.S. Cl. 343—374 **8 Claims**



1. An antenna system for scanning a beam through selected spatial positions comprising:

an array of arcuately disposed antenna elements;

switch means coupled to said array for selecting elements therefrom to form selected sub-arrays;

means responsive to signals coupled to first terminal means thereof for providing substantially uniformly distributed signals to second terminal means thereof; and

variable distribution means having a plurality of input ports coupled to said second terminal means of said uniform distribution means and a multiplicity if ouput ports coupled to said switch means for varying signal coupling coefficients between said selected elements and said uniform distribution means, thereby establishing selectable aperture distributions for said sub-arrays, said variable distribution means including:

first coupler means having first and second input means coupled to said plurality of input ports and having first and second output means coupled to said switch means for coupling signals incident to said first input means thereof

to said first and second output means with a predetermined amplitude ratio and a predetermined phase difference therebetween and for coupling signals incident to said second input means thereof to said first and second output means with said predetermined amplitude ratio and a phase difference therebetween that is opposite said predetermined phase difference; and

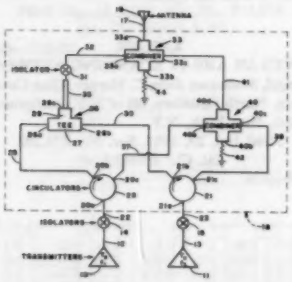
first and second variable phase shift means having output ports coupled respectively to said first and second input means of said first coupler means and input ports coupled to said uniform distribution means for providing phase shifts to signals incident to said first and second input means of said coupler means to aportion said incident signal between said first and second output means of said coupler means in accordance with desired amplitude ratios.

4,451,832

RADIO FREQUENCY TRANSMITTER COUPLING CIRCUIT

Francis H. Stites, Wayland, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,878
Int. Cl.³ H01Q *5/00*
U.S. Cl. 343—858 **11 Claims**



1. A circuit for coupling an antenna to the outputs of at least two transmitters comprising

first and second circulators, each of said circulators having first, second and third ports nonreciporcally connected in that order,

a connector and a first power combiner, said connector and said combiner each having first and second input ports and a third output port, said connector having a predetermined impedance mismatch between said output port thereof and each of said input ports thereof characterized by a 3 to 1 voltage standing wave ratio of said output port thereof relative to said input ports thereof, said combiner producing at said third port thereof the sum of the signal power incident on said first and second ports thereof,

the first and second ports of said connector being connected with equal phase delays to the second ports, respectively, of said first and second circulators, the first and second ports of said combiner being connected to the third ports, respectively, of said first and second circulators, with phase delays equal to each other and to each of the first named phase delays,

a second power combiner having first and second input ports and a third output port, said second combiner producing at the third port thereof the sum of signal power incident on said input ports thereof,

said third ports of said connector and said first combiner being connected to said first and second ports, respectively, of said second combiner,

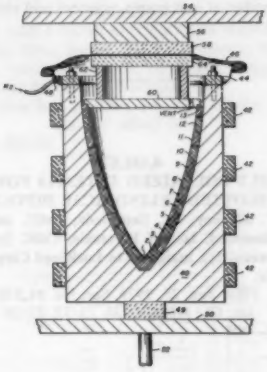
said antenna being connected to said third port of said second combiner.

4,451,833

RADOME FORMED OF SEGMENTED RINGS OF FIBER-PTFE COMPOSITE

G. Robert Traut, South Killingly, Conn., assignor to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 149,952, May 15, 1980, Pat. No. 4,364,884.
This application Jan. 18, 1982, Ser. No. 339,839
Int. Cl.³ H01Q *1/40*
U.S. Cl. 343—872 **2 Claims**



1. A radome blank comprising:

a tip portion, said tip portion being symmetrical with respect to the radome axis and being continuous, said tip portion being formed with an annular planar surface area, said planar surface area defining a frustoconical shape; and

a tubular portion extending from and integral with said tip portion, said tubular portion being coaxial with said tip portion and terminating at an annular surface having a radius greater than said tip portion annular surface area, said tubular portion being formed a plurality of ring-shaped segments, said segments each having a different average outer diameter, abutting surfaces of said segments being perpendicular to the radome outer surface, extensions of said abutting surfaces intersecting said axis at an angle of other than 90°;

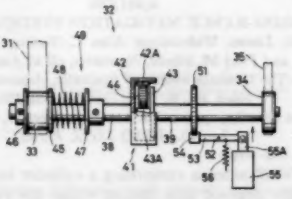
said tip and tubular portions being comprised of a fiber-polytetrafluoroethylene composite and said segments being diffusion bonded to form an integral structure.

4,451,834

TRANSFER TYPE HEAT SENSITIVE RECORDING DEVICE

Hisao Nakajima, and Fujio Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,221
Claims priority, application Japan, Aug. 19, 1981, 56-128772
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **4 Claims**



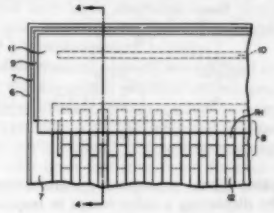
1. A transfer type heat sensitive recording device comprising

recording means for transferring ink from an ink donor sheet to a recording sheet superimposed thereon by applying thermal pulses, separating means for separating said recording sheet from said ink donor sheet after said thermal transfer recording has been effected, ink donor sheet conveying means for continuously conveying an indeterminate length donor sheet through said recording section and said separating means and for stopping the conveyance of said ink donor sheet when the rear edge of said recording sheet is separated from said ink donor sheet by said separating means, recording sheet supplying means for supplying a recording sheet having a finite length, recording sheet discharge means for discharging said recording sheet after separation by said separating means and a drive force accumulating mechanism for accumulating a portion of the drive force for said ink donor sheet conveying means when said ink donor sheet conveying means is operated and which continues to drive said recording sheet discharge means for a predetermined time subsequent to the stopping of said ink donor sheet conveying means to complete the discharge of said recording sheet.

4,451,835
THERMAL RECORDING DEVICE

Tamio Saito, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1982, Ser. No. 434,390
Claims priority, application Japan, Oct. 19, 1981, 56-166742
Int. Cl.³ G01D *15/10*; H05B *1/00*
U.S. Cl. 346—76 PH **2 Claims**



1. A thermal recording device comprising:

a thermal head section which includes at least one recording unit for recording data on a thermal sensitive medium, said recording unit including a plurality of resistive elements formed on a surface of an insulation member, and a common electrode formed on said surface for connecting one end of each of said resistive elements corresponding to said recording unit; and

a drive section connected between said common electrode and the other end of each of said resistive elements for selectively feeding current into said resistive elements according to data to be recorded; wherein

said thermal head section comprises an insulation layer provided on said common electrode and having an opening which is provided at a position on said common electrode, and a conductive layer provided on said insulation layer for coupling said common electrode with said one end of each of said resistive elements, through said opening.

4,451,836
OPTICAL DISC WRITE/READ APPARATUS

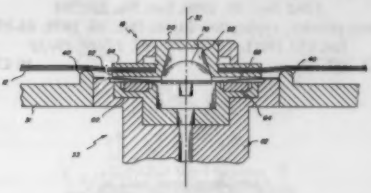
Eric M. Leonard; Frederick F. Geyer, both of Rochester, and George M. Myers, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,204
Int. Cl.³ G01D *15/32*
U.S. Cl. 346—137 **4 Claims**

1. Optical disc write and/or read apparatus adapted for use with an optical disc assembly including (1) a flexible, disc-shaped support carrying a record layer with an annular storage region, (2) an annular retaining ring engaging said support around its peripheral region, and (3) a central hub; said apparatus comprising:

(a) lens means for focusing light at a focal plane normal to a predetermined axis;

(b) disc assembly receiving structure having (1) an annular locating surface rotatable about said axis in a plane normal



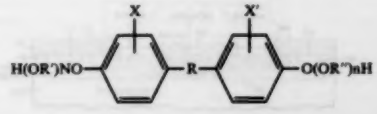
to said axis, and (2) means for mounting the central hub of a disc assembly such that an annular area of the disc assembly support radially inward of said storage region is in a predetermined abutting force against the locating surface of said receiving structure to provide firm contact between the disc assembly support and said locating surface.

4,451,837
CONDUCTIVE SINGLE COMPONENT MAGNETIC TONER FOR USE IN ELECTRONIC PRINTING DEVICES

Robert J. Gruber, Pittsford, and John F. Knapp, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 188,487, Sep. 18, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,662
Claims priority, application Spain, Sep. 17, 1981, 505.586; United Kingdom, Sep. 18, 1981, 8128306
Int. Cl.³ G03G *13/00*
U.S. Cl. 346—153.1 **3 Claims**

1. A process for developing images in electronic printing systems which process consists of forming an electronic image in an electronic printing device, followed by developing the image with a conductive single component magnetic dry toner composition of a conductivity of from 10^{-6} to 10^{-8} $(ohms/cm)^{-1}$, and a fusing temperature of from about 95 degrees Centigrade to about 130 degrees Centigrade, comprises of a magnetic material present in an amount of from about 40 percent by weight to about 80 percent by weight, and from about 20 percent by weight to about 60 percent by weight of a polyester resin, comprised of the polymeric esterification product of a dicarboxylic acid and a diol comprising a diphenol of the formula:



wherein R is selected from substituted and unsubstituted alkylene radicals containing from about 2 to about 12 carbon atoms, alkylidene radicals containing from 1 to about 12 carbon atoms, and cycloclkylidene radicals containing from about 3 to about 12 carbon atoms; R' and R'' are selected from substituted and unsubstituted alkylene radicals containing from about 2 to about 12 carbon atoms, alkylene arylene radicals containing from about 8 to about 12 carbon atoms and arylene radicals; X and X' are selected from hydrogen or alkyl radicals containing from 1 to about 4 carbon atoms; and each n is a number of from 0 (zero) to 4, and a conductive carbon black present in an amount of from about 0.5 percent to about 4 percent, which

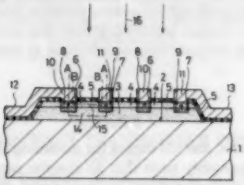
carbon black is adhered to or embedded in the surface of the polyester magnetic mixture.

4,451,838

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,781
Claims priority, application Japan, Dec. 30, 1979, 54-171477
Int. Cl.³ H01L *45/00, 29/161, 27/14, 29/12*
U.S. Cl. 357—2 **10 Claims**



1. A semiconductor photoelectric conversion device comprising:

a supporting member;

a first semiconductor layer formed on the supporting member;

a second semiconductor layer formed on the first semiconductor layer;

P type and N type semiconductor regions formed in the second semiconductor layer; and

first and second electrodes formed over the second semiconductor layer and contacting P type and N type semiconductor regions;

wherein the first and second semiconductor layers are formed of amorphous or semi-amorphous semiconductor and are intrinsic;

wherein the second semiconductor layer has a larger energy gap than the first semiconductor layer, and

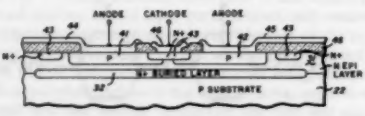
wherein the P type and N type semiconductor regions are spaced apart and are in contact with the first semiconductor layer.

4,451,839

BILATERAL ZENER TRIM

Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 186,797, Sep. 12, 1980, abandoned. This application Apr. 19, 1983, Ser. No. 486,153
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **7 Claims**



1. A back to back diode structure for use in the trimming of a monolithic semiconductor integrated circuit in which one or more of a plurality of trimming resistors may be shorted out by passing a relatively large current through a selected parallel connected diode, said back to back diodes being contactable in pairs with the selection of which one of said pair will be shorted out being determined by the polarity of said relatively large current wherein the reverse biased one of said pair will be damaged and thereby shorted and wherein the forward biased one of said pair will pass said relatively large current without damage, said structure comprising:

a semiconductor body of one conductivity type;

first and second spaced apart regions of opposite conductivity type arrayed in said body,

a third region of said one conductivity type located to overlap said first and second regions in selected portions thereof, thereby to create said back to back diode structure in said selected portions;

an extension of said third region surrounding said first and second regions and spaced therefrom except in said selected portions whereby said diodes have enhanced conductivity around their perimeters when forward biased so as to minimize damage thereto in passing said relatively large current; and

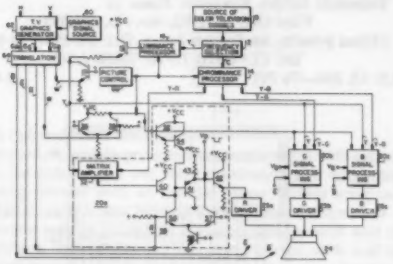
means for making electrical connection to said first, second and third regions.

4,451,840

PICTURE CONTROL FOR TELEVISION RECEIVER ON-SCREEN DISPLAY

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 325,049
Int. Cl.³ H04N *5/22*
U.S. Cl. 358—22 **5 Claims**



1. In a video signal processing system including a color kinescope for displaying a color image in response to signals applied to plural intensity control electrodes thereof, and plural signal paths for respectively coupling image representative signals to said kinescope control electrodes; apparatus comprising:

means for providing image representative color graphics information signals including a graphics drive signal and plural graphics blanking signals;

means for coupling said graphics drive signal in common to each of said signal paths for enabling said kinescolpe to display graphics information;

means for respectively coupling said plural graphics blanking signals to said plural signal paths for blanking selected outputs of said signal paths to thereby determine the color of displayed graphics information; and

control means for varying the level of said common graphics drive signal to thereby control the contrast of displayed graphics information.

4,451,841

SEMICONDUCTOR DEVICE WITH MULTI-LAYERED ELECTRODES

Ryoichi Hori, Tokyo; Masaharu Kubo, Hachioji; Norikazu Hashimoto, Tokorozawa; Shigeru Nishimatsu, Kokubunji, and Kiyoo Itoh, Higashi-Kurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

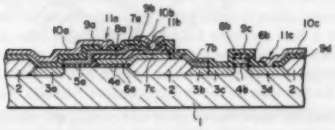
Division of Ser. No. 880,618, Feb. 23, 1978, Pat. No. 4,270,262. This application Jan. 15, 1981, Ser. No. 225,268
Claims priority, application Japan, Mar. 4, 1977, 52-22681
Int. Cl.³ H01L *29/78, 27/02, 29/34, 29/04*
U.S. Cl. 357—23.6 **22 Claims**

1. A semiconductor device comprising:

(a) a first field-effect circuit element formed in a surface

region of a semiconductor substrate, said first field-effect circuit element including a first gate insulating layer in a first part of the surface region of said substrate, a first gate electrode which is disposed on said first gate insulating layer and which is made of a first conductive layer, and a first interlayer insulating layer which is disposed on said first gate electrode and which has a first opening penetrating a part of said first inter-layer insulating layer;

(b) a second field-effect circuit element formed in the surface region of said semiconductor substrate, said second field-effect circuit element including a second gate insulating layer in a second part of the surface region of said substrate, a second gate electrode which is made of a second conductive layer disposed so that a first part of said second gate electrode overlies said second gate insulating layer and a second part of said second gate electrode overlies said first inter-layer insulating layer at a position other than said first opening;



(c) a second inter-layer insulating layer disposed on said second gate electrode and having a second penetrant opening at a predetermined position,

(d) a first interconnection conductor disposed in said second opening and connected with said second gate electrode,

(e) a subsidiary interconnection conductive layer disposed in said first opening, connected with said first gate electrode, and electrically isolated from said second electrode,

(f) a third inter-layer insulating layer disposed on said first inter-layer insulating layer, and having a third opening, and

(g) a second interconnection conductor disposed in said third opening and connected with said subsidiary interconnection conductive layer, said second interconnection conductor and said subsidiary interconnection conductive layer being formed of different conductive materials, said second interconnection conductor forming an interconnection for said first gate electrode.

4,451,842

LARGE SCALE INTEGRATED FOCAL PLANE

Dieter H. Pommerrenig, El Toro, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 29, 1980, Ser. No. 220,676

Int. Cl.³ H01L *27/14, 29/78, 23/48, 25/04*

U.S. Cl. 357—30 **15 Claims**

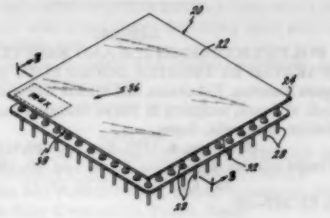
1. A wafer of properly doped photoconductive semiconductor material having a front and rear surface and a first plurality of charge coupled device multiplexers having input terminals;

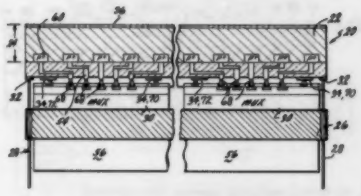
said front surface being transparent to electromagnetic energy in the frequency range of photoconductivity of said wafer and being electrically conductive to electromagnetic energy of at least some lower frequency;

heat sink means in good thermal contact with said wafer rear surface;

said rear surface having a second plurality of photodetectors integral with said wafer and disposed uniformly thereover in such a fashion that distance between adjacent photodetectors is greater than the distance between adjacent input terminals of said multiplexers, distance between detectors closest to a rear surface edge and the edge itself being half the distance between adjacent detectors;

an insulative layer deposited over said rear surface having electrically conductive columns thereon so disposed as to be directly opposite said input terminals of said multiplexers; and





electrical conductor means coupling said photodetectors to said conductive columns, said conductive columns being mechanically bonded and electrically coupled to said input terminals.

4,451,843

BIPOLAR TRANSISTOR WITH A PLURALITY OF PARALLELLY CONNECTED BASE-COLLECTOR JUNCTIONS FORMED BY PLASTIC DEFORMATION OF THE CRYSTAL LATTICE

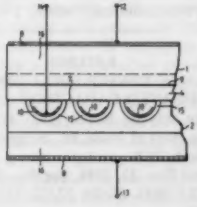
Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Higratherm Electric GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,560

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926785

Int. Cl.³ H01L *29/72*

U.S. Cl. 357—36 **15 Claims**



1. A bipolar transistor having a collector-base p/n junction produced by means of plastic deformation comprising: a p-doped and an n-doped monocrystalline semiconductor plate, disc or chip; both semiconductor plates, discs or chips have a structure comprising parallel ridges on one main face; one semiconductor disc forms a base region and contains an opposite conductivity type emitter region on its opposite main face so as to form an emitter-base p/n junction; the side surfaces of the ridges in the other semiconductor plate, disc or chip have a highly doped surface layer with the type of conductivity of the base region; both semiconductor discs are assembled, by mechanical pressure, so that the ridges of the structured faces of both plates, discs or chips cross and touch; and the surfaces

of said ridges which are in contact are connected together and form electrically parallel base-collector p/n junctions of equal area as a result of plastic deformation of the semiconductor lattice.

4,451,844

POLYSILICON EMITTER AND BASE CONTACTS SEPARATED BY LIGHTLY DOPED POLY SEPARATOR

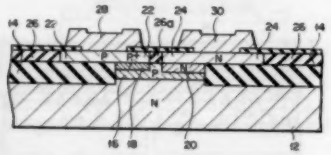
Shigeru Komatsu, Yokohama, and Michio Nakamura, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 4, 1981, Ser. No. 289,961

Claims priority, application Japan, Aug. 20, 1980, 55-114211

Int. Cl.³ H01L *23/50, 23/52*

U.S. Cl. 357—59 **5 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

an insulation layer of a predetermined pattern for selectively covering the substrate;

a first region of a second conductivity type formed in that area of the substrate which is defined by the insulation layer;

a second region of the second conductivity type having a high impurity concentration and formed in the first region;

a third region of the first conductivity type formed in the first region; and

a polycrystalline silicon layer formed on the major surface of the substrate, said polycrystalline silicon layer comprising a first portion of the second conductivity type contacting the second region, a second portion of the first conductivity type contacting the third region and a third portion contacting the first region, said first and second portions having high impurity concentrations constituting first and second contacting electrodes, respectively, and the third portion having a low impurity concentration and constituting a separation portion for insulating the first and second portions from each other.

4,451,845

LEAD FRAME DEVICE INCLUDING CERAMIC ENCAPSULATED CAPACITOR AND IC CHIP

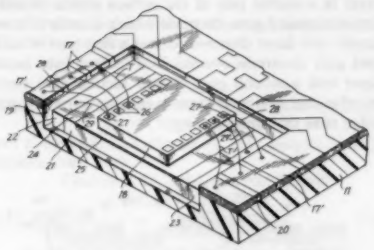
Elliott Philofsky, Myrtle Beach, S.C.; Ward Parkinson, and Dennis Wilson, both of Boise, Id., assignors to AVX Corporation, Great Neck, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,411

Int. Cl.³ H01L *23/28, 27/02, 23/48, 23/16*

U.S. Cl. 357—72 **3 Claims**

1. As a new article of manufacture, an integrated circuit device comprising a ceramic container including a lower shell half having a perimetral upper surface surrounding an upwardly facing central recess area and an upper shell half having a downwardly facing central recess area registering with the recess area of said lower shell half, said shell halves being bonded together along a planar parting line coincident with said upper surface of said lower shell half and together defining a chamber having a floor portion in said lower shell half, a ceramic chip capacitor bonded to said floor portion of said chamber, said capacitor including an upper surface portion and end terminations, an IC chip having an undersurface portion bonded to said upper surface portion of said capacitor, said chip including a pair of power supply input terminals, each said terminal being in proximate spaced relation to a respective one of said end terminations, a plurality of mutually spaced planar conductor members forming elements of an elongate lead frame sub-assembly interposed between said shells at said planar parting line, said conductor members being bonded to said upper surface of said lower shell half by a layer of low temperature melting insulating compound, the spaces between said conductor members being filled with increments of said insulating compound whereby the upper surface of said com-



pound and the upper surfaces of said conductor members are in substantially co-planar alignment, said conductor members having inner end portions defining border portions of the said chamber and having outer end portions extending externally of said container, a first pair of connectors disposed within said chamber, each extending between a respective one of said power supply input terminals and end terminations, and a second pair of connectors within said chamber, each connecting one of said power supply input terminals with a different one of said conductor members.

4,451,846

COLOR IMAGE DISPLAY APPARATUS

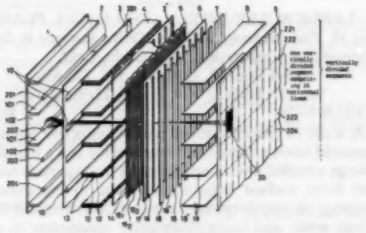
Sadahiro Iyehara, Suita; Mitsuya Masuda, Kyoto; Shizuo Inohara, Toyonaka; Minoru Ueda, Takatsuki, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 28, 1982, Ser. No. 343,751

Claims priority, application Japan, Feb. 10, 1981, 56-18781; Feb. 13, 1981, 56-20618

Int. Cl.³ H04N *9/12, 9/16*

U.S. Cl. 358—56 **9 Claims**



1. A color image display apparatus comprising:

a color phosphor screen comprising a first predetermined number of horizontally divided sections each comprising a set of regions of primary color phosphors,

an electron beam source for in-turn emitting a second predetermined number of horizontal rows of electron beams, each row having said first predetermined number of electron beams, producing one horizontal line on said color screen,

a horizontal deflection means for selective impingements of said electron beams on said regions in turn selected corresponding kinds of primary color phosphors at one time, in turn changing colors of said horizontally divided sections,

a vertical deflection means for vertically deflecting said electron beams in such a manner that electron beams of a horizontal row impinges said phosphor screen in one vertically divided segment which is corresponding to said one horizontal row, thereby vertically moving said one horizontal row, thereby vertically moving said one horizontal line in said vertically divided segment,

an electron beam control means for simultaneous controlling of intensities of respective electron beams responding to a color video signal for said selected kind of primary color, to produce a line-at-a-time displaying of a color video picture,

a flat shaped vacuum enclosure containing the above-mentioned components therein, one end face thereof forming a screen face in which said color phosphor screen is provided, and

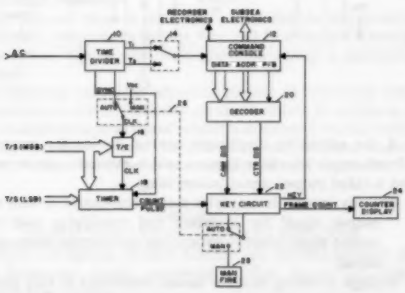
said electron beam control means comprising a sample-hold means for sample-holding color video signals, corresponding to said horizontally divided sections, and a memory for storing output signals of said sample-hold means and electronic-switch means each for feeding a signal of an in-turn selected primary color out of said stored output signals at one time to said electron beam control means, to produce said line-at-a-time displaying.

4,451,847

AUTOMATIC STROBE/CAMERA CONTROL UNIT

Virgel J. Young, Picayune, and Harry S. Myers, Jr., Long Beach, both of Miss., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1982, Ser. No. 389,521
Int. Cl.³ H04N 3/00
U.S. Cl. 358—99 **3 Claims**



1. An automatic control unit for operating remote apparatus comprising:

mean for generating a plurality of timing signals from an a. c. input signal, said timing signals including a clock pulse signal and a long interval pulse for external use;

a timer to which said clock pulse signal from said generating means is input, said timer having means for counting the pulses of said clock pulse signal and means for comparing the resulting count with a preselected count equivalent to a predetermined rate for providing output pulses at said predetermined rate;

means for inhibiting said clock pulse signal from said generating means from being input to said timer when said preselected count is less than a predetermined minimum value;

a decoder to receive command data, said decoder outputting a command function which is determined by said command data;

a key circuit controlled by said command function from said decoder, said key circuit providing a key closure signal to operate said remote apparatus and/or a frame count pulse for each of said output pulses depending upon said command function; and

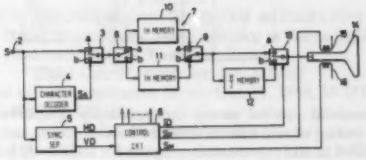
a counter display to count and display said frame count pulses from said key circuit.

4,451,848

TELEVISION RECEIVER INCLUDING A CIRCUIT FOR DOUBLING LINE SCANNING FREQUENCY

Takashi Okada, and Yutaka Tanaka, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,944
Claims priority, application Japan, Dec. 26, 1980, 55-189300
Int. Cl.³ H04N 3/27, 5/02
U.S. Cl. 358—140 **1 Claim**



1. A television receiver comprising: an input terminal for receiving first video signals which include character information signals during vertical blanking periods where a character signal of an odd interlaced field is identical with a character signal of a succeeding even field; a character decoder connected to said input terminal for detecting said information signals and converting the same to second video signals, first switching means connected to said input terminal and said character decoder for switchably selecting one of said first and second video signals, a scanning converter connected to said first switching means for doubling the frequency of the selected video signals, a display means, means for supplying said frequency doubled video signals to said display means for a visual display, including field identification means connected to said input terminal for detecting odd fields from even fields, and control means connected to said field identification means and said display means for controlling the scanning of said display means such that the scanning of the lines of said odd fields are substantially delayed by H/2 where H is the normal horizontal scanning period with respect to those of said even fields, and wherein said means for supplying said frequency doubled video signals includes a delay circuit of H/2 connected to said scanning converter and second switching means for switchably supplying one of the input and output signals of said delay circuit to said display means and wherein said control means controls said second switching means and wherein an interlaced signal is converted to a non-interlaced signal and wherein corresponding lines of the even and odd fields beginning with the first line in each field are superimposed and each such superimposed line is scanned twice on said display means.

4,451,849

PLURAL OPERATING MODE AMBIENT LIGHT RESPONSIVE TELEVISION PICTURE CONTROL

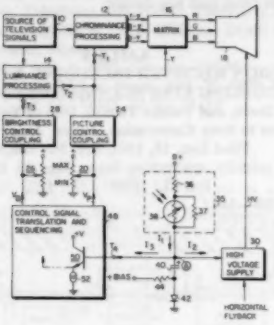
Jack S. Fuhrer, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,415
Int. Cl.³ H04N 9/535
U.S. Cl. 358—161 **9 Claims**

1. In a video signal display system including a video signal processing channel; an image reproducing device for producing a picture display on a viewing screen in response to output

video signals from said signal channel; and manually adjustable picture contrast control means for manually controlling the gain of said signal channel; automatic picture contrast control apparatus for automatically controlling the gain of said signal channel, comprising:

sensing means for providing output signals representative of the ambient light level striking said display screen, and representative of the average video signal level; and



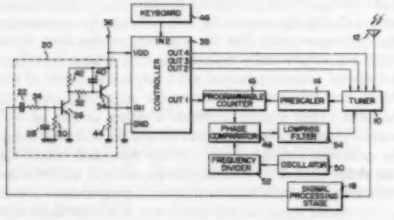
threshold control means independently operative of the setting of said manual contrast control means and responsive to said representative signals for selectively providing to said video channel an automatic contrast control voltage for reducing picture contrast proportionally with reduced ambient light levels when a prescribed combination of ambient light level and average video signal level causes an operating threshold of said control means to be exceeded.

4,451,850

CHANNEL SELECTING DEVICE

Kazuhiro Kamemoto, Kumagaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 31, 1981, Ser. No. 289,077
Claims priority, application Japan, Aug. 5, 1980, 55-107284
Int. Cl.³ H04N 5/44
U.S. Cl. 358—191.1 **3 Claims**



1. A channel selecting device comprising:

tuner means, including a local oscillator, for receiving transmission signals;

channel number setting means for specifying a channel number;

means, connected to said tuner, for discriminating a broadcast signal;

variable frequency dividing means, connected to said tuner, for dividing the frequency of an output signal from the local oscillator according to the set channel number;

frequency dividing ratio setting means for setting a frequency dividing ratio of said variable frequency dividing means at a first value so as to make the frequency of the local oscillator lower than a predetermined frequency corresponding to the set channel number when a channel number is set for setting the ratio at a second value so as to make the frequency of the local oscillator equal to the predetermined frequency corresponding to the channel number when said discriminator means discriminates a broadcast signal;

means for generating a reference signal at a reference frequency; and

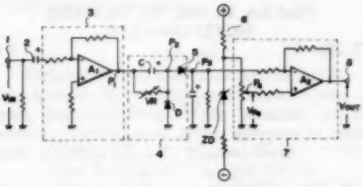
means for comparing the phase of an output signal from said variable frequency dividing means and a phase of an output signal from said reference signal generating means and for controlling the frequency of the local oscillator according to the phase difference therebetween.

4,451,851

AUTOMATIC DIAPHRAGM CONTROL DEVICE FOR A CLOSED CIRCUIT TELEVISION CAMERA

Masayuki Arai, and Terumi Ogasawara, both of Nerima, Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,536
Claims priority, application Japan, Aug. 3, 1981, 56-121556
Int. Cl.³ H04N 5/26
U.S. Cl. 358—228 **9 Claims**



1. An automatic diaphragm control device for use with a closed circuit television camera, said television camera producing a video output signal, comprising:

polarity inversible amplifier means responsive to said video output signal for inverting and amplifying said video output signal thereby producing an inverted video output signal;

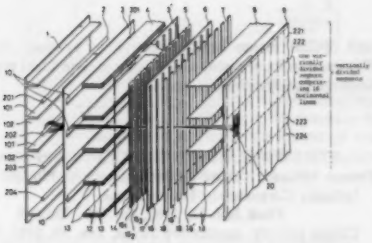
voltage doubling rectifier means connected to said polarity inversible amplifier means for rectifying said inverted video output signal thereby producing a DC voltage, said voltage doubling rectifier means including voltage doubling means for providing a voltage doubling function and adjusting means connected in parallel with the voltage doubling means for adjusting the voltage across said voltage doubling means thereby effecting changeover of said voltage doubling rectifier means between an average light measuring mode and a peak light measuring mode whereby said voltage doubling rectifier operates in an average mode when set in the average light measuring mode and operates in a peak mode when set in the peak mode; and

comparator means responsive to said DC voltage and to a separately provided reference voltage for comparing the DC voltage with the reference voltage and for developing a diaphragm control signal in response thereto.

4,451,852
IMAGE DISPLAY APPARATUS

Mitsuya Masuda, Kyoto; Sadahiro Iyehara, Suita; Shizuo Inohara, Toyonaka; Minoru Ueda, Takatsuki, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 28, 1982, Ser. No. 343,755
Claims priority, application Japan, Feb. 10, 1981, 56-18782; Jun. 18, 1981, 56-94993
Int. Cl.³ H04N 9/12, 5/66; H01J 31/10
U.S. Cl. 358—230 11 Claims

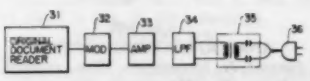


1. An image display apparatus comprising:
a phosphor screen having a phosphor layer for emitting light at impingement by an electron beam,
an electron beam source for in-turn emitting a predetermined number of horizontal rows of electron beams, for producing horizontal lines of image on said phosphor screen,
a vertical deflection means for vertical deflections of said electron beams of said horizontal rows in a manner that electron beams of a horizontal row impinging said phosphor screen at one vertically divided segment of said phosphor screen corresponding to one of said horizontal rows are simultaneously driven vertically, thereby vertically moving one of said horizontal lines in said vertically divided segment,
a flat shaped vacuum enclosure containing the above-mentioned components therein, one end face thereof forming a screen face in which the phosphor screen is provided, and
an adjusting means for adjusting pitches of horizontal lines produced in said vertically divided segment by adjusting a vertical deflection signal which is impressed on said vertical deflection means for deflecting said electron beams vertically, for respective vertically divided segments.

4,451,853
IMAGE DATA TRANSMISSION PROCESS

Harukiko Moriguchi; Masami Kurata, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1982, Ser. No. 349,106
Claims priority, application Japan, Feb. 20, 1981, 56-23138
Int. Cl.³ H04N 1/40
U.S. Cl. 358—281 1 Clai-

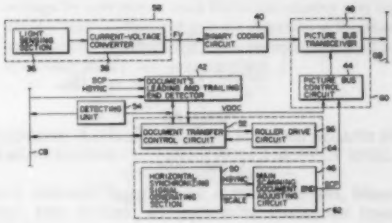


1. A method for transmitting image information within a building, comprising the steps of:
scanning a document to be transmitted and producing a binary signal indicative of image information contained on said document;
producing a modulation signal in response to said binary signal, said modulation signal having a frequency of substantially 300 KHz for a first state of said binary signal and a frequency of 400 KHz for a second state of said binary signal;
amplifying said modulation signal to a power of 10 mW;
low-pass filtering the amplified modulation signal with a cut-off frequency of 450 KHz;
coupling the filtered and amplified modulation signal to an electrical power transmission line in said building at a first location;
at a second location in said building, coupling said electric power transmission line to a second filter;
amplifying an output of said second filter;
demodulating the amplified filtered signal received from said electric power transmission line at said second location; and
producing a recorded image in response to the demodulated signal.

4,451,854
PICTURE INFORMATION INPUT APPARATUS

Junichi Daigo, Nagareyama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 27, 1981, Ser. No. 315,657
Claims priority, application Japan, Oct. 31, 1980, 55-153232; Oct. 31, 1980, 55-153251
Int. Cl.³ H04N 1/40
U.S. Cl. 358—282 4 Claims



1. A picture information input apparatus for reading information from an object comprising:
transfer means for transferring an object to be read from an input position to a scanning position;
optical scanning means for scanning said object at said scanning position with radiation, and producing a synchronizing signal in synchronism with said scanning;
optical converting means for converting radiation reflected from said object into an analog information signal;
binary coding means for coding said analog signal from said optical converting means into white and black picture information;
detection means for generating an object present signal indicative of the presence or absence of said object;
leading and trailing edge detecting means for detecting the leading and trailing edges of said object and providing an edge read out signal indicative thereof, said edge detecting means comprising:
(a) first counter means for carrying out a specified count of said white information in a scanning direction of said object;
(b) first timer means for measuring a time from when said object is at said initial position to when a scanned portion thereof is reached;
(c) second counter means for measuring the duration of an object presence signal indicating the absence of an object the maximum time of said second counter means corresponding to a predetermined maximum permitted hole diameter of the object;
(d) third counter means, having a "set" input coupled to

an output of said second counter means, for determining a time difference between a time measured by said second counter means and the transfer time between the presence/absence detection of the objeft and the arrival of said object at said scanning section; and

(e) latch means for receiving either a signal from said first counter means or a signal from said first timer means as a leading edge detection signal, and receiving a signal from said third counter means as the leading edge detection means;

drive means for driving said transfer means in accordance with said object present signal from said detecting means and the read out signal from said leading and trailing edge detecting means; and

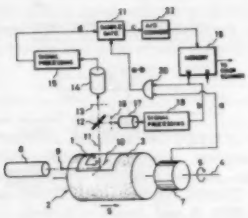
picture data transmitting means for transmitting binary picture information from said binary coding means in accordance with said synchronizing signal from said optical scanning means from when said leading edge detection signal is latched by said latch means to when said trailing edge detection signal is latched by said latching means.

4,451,855

RELATION DENSITY CALCULATION SYSTEM

Masahiko Konagaya, Kobe, Japan, assignor to Konan Camera Research Institute, Hyogo, Japan

Filed Sep. 4, 1981, Ser. No. 299,590
Claims priority, application Japan, Sep. 9, 1980, 55-125623
Int. Cl.³ H04N *1/06, 1/40*
U.S. Cl. 358—289 **3 Claims**



1. A relative density calculation system for a transparent image, said image secured by a surrounding frame carried on a support drum, said system comprising: means for scanning said transparent image using both visible and infrared light, first and second transducer means responsive to said visible and infrared light passed through said transparent image, respectively, said first and second transducer means producing first and second electric signals representative of the magnitudes of said visible and infrared light, respectively, A/D converter means for digitizing said first electric signal, and memory means, responsive to said second electric signal, for storing said digitized first electric signal, whereby the content of said memory is representative of the relative density calculation of said image.

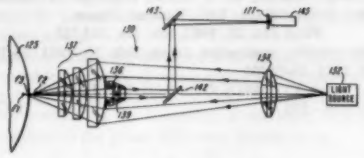
4,451,856

ENGRAVING AND SCANNING APPARATUS

Lester W. Buechler, Dayton, Ohio, assignor to Ohio Electronic Engravers, Inc., Dayton, Ohio

Division of Ser. No. 56,623, Jul. 11, 1979, Pat. No. 4,357,653.
This application Sep. 24, 1982, Ser. No. 422,653
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—299 **7 Claims**

1. Apparatus adapted for engraving the surface of a gravure printing cylinder, comprising an engraving head, means supporting said head for relative movement adjacent the surface, said head including a shaft and an engraving stylus, means on said shaft and supporting said stylus eccentrically of the axis of said shaft, means supporting said shaft and said stylus for oscillation, power operated drive means for oscillating said shaft and said stylus, a copy scanner having a light source, optical means for concentrating light rays on the copy being scanned and for also detecting the light rays reflected by the copy, and



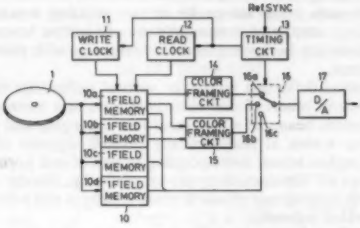
said optical means being effective to produce two spaced illumination focal points and a copy pickup focal point spaced between the illumination points.

4,451,857

STILL PICTURE REPRODUCING APPARATUS

Tsuneo Mikado, Tokyo, Japan, assignor to Nippon Television Industry Corporation, Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,649
Claims priority, application Japan, Jan. 19, 1981, 56-7072
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—312 **7 Claims**



1. A still picture reproducing apparatus comprising:

(a) means for reproducing still picture information having a 4-field sequence of NTSC system from a recording medium, with the time base of reproduced still picture information being extended from the time base of a normal video signal;

(b) a memory for storing reproduced still picture information of four fields;

(c) a memory read control means for reading out the contents of said memory, with picture information being compressed in time so that the normal time base is restored;

(d) a color framing circuit for producing an NTSC color video signal having the 4-field sequence from a memory output for at least one field; and

(e) a switch circuit for selecting one of the output from said color framing circuit and the output for four fields from said memory.

4,451,858

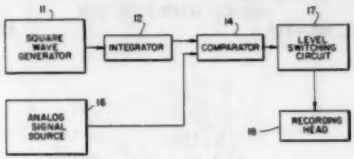
ANALOG RECORDING SYSTEM

Clark E. Johnson, Jr., Minneapolis, Minn., assignor to Vertimag Systems Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 233,181, Feb. 10, 1981, which is a continuation of Ser. No. 966,357, Dec. 4, 1978, abandoned.
This application Jan. 18, 1982, Ser. No. 339,987
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—32 **8 Claims**

1. A method for recording an analog signal, comprising generating a squarewave having positive and negative por-

tions, said generating including a modulating of the square-wave by the analog signal with the average of the positive and negative portions of said squarewave being substantially proportional to the instantaneous value of said analog signal, and recording by vertical recording on magnetic tape having an



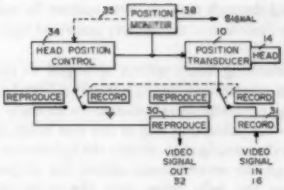
easy axis of magnetization perpendicular to the surface of the tape a plurality of squarewave cycles per unit of recording tape equal to the length of the gap of a playback head means for playing back said magnetic tape, whereby the output of said playback head means is the average of a plurality of square-wave cycles under said gap at any time.

4,451,859

MAGNETIC VIDEO HEAD POSITION CONTROL

Stan L. Noel, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,736
Int. Cl.³ G11B *5/52, 21/00*
U.S. Cl. 360—75 **17 Claims**



1. Apparatus for controlling the position of a positionable magnetic head, said apparatus comprising:

a positionable magnetic head;

means for applying a constant potential to said positionable magnetic head so that the positionable magnetic head is rigidly held in a fixed position;

means for comparing said constant potential with a predefined voltage; and,

means for producing an output if said constant potential differs from said predefined voltage.

4,451,860

TRACKING-ERROR CORRECTING SYSTEM IN A VIDEO REPRODUCING APPARATUS

Masahiro Honjo, and Masao Tomita, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1981, Ser. No. 309,497
Claims priority, application Japan, Oct. 9, 1980, 55-141209; Jan. 16, 1981, 56-5273; Jun. 12, 1981, 56-91181
Int. Cl.³ G11B *5/58*
U.S. Cl. 360—77 **8 Claims**

1. A tracking-error correcting system in a video reproducing apparatus, comprising:

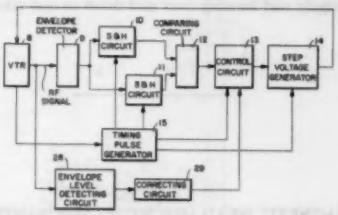
an envelope detecting means for detecting an envelope of a reproduced video signal;

two sampling and holding means each for sampling and holding an output signal from said envelope detecting means at a predetermined timing in each frame;

a timing pulse generating means for generating a sampling pulse which is supplied once to one of said two sampling and holding means at said predetermined timing in each frame and for generating clock signals, said sampling pulse being supplied alternatingly to said two sampling and holding means so that each of said two sampling and holding menas carries out its sampling operation at said predetermined timing in every two frames;

a comparing means for comparing output signals from said two sampling and holding means;

a control voltage generating means for generating a control



voltage which varies step by step for controlling movement of a reproducing head; and

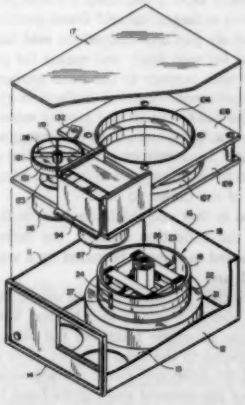
a controlling means for controlling said control voltage generating means by signals from said comparing means and said timing pulse generating means, whereby said control voltage generating means changes said control voltage by one step in each frame for causing said reproducing head to move one step in a direction to increase the amplitude of said envelope when reproducing head is not in contact with a magnetic tape.

4,451,861

MAGNETIC TAPE APPARATUS HAVING MEANS FOR LEADING MAGNETIC TAPE FROM A SUPPLY REEL TO A TAKE-UP REEL

Paul A. Gilovich, Saratoga, and James S. Toreson, Mountain View, both of Calif., assignors to Microcomputer Systems, Inc., Sunnyvale, Calif.

Division of Ser. No. 151,394, May 19, 1980, Pat. No. 4,354,211.
This application Apr. 16, 1982, Ser. No. 369,206
Int. Cl.³ G11B *5/08*
U.S. Cl. 360—84 **1 Claim**



1. A magnetic tape apparatus comprising a drum, means for supporting and rotating said drum about its axis, at least one transducer extending past the surface of said drum and adapted to rotate therewith, means for moving the transducer along

said drum parallel to the axis, a take-up reel disposed adjacent said drum, take-up reel drive means for driving said take-up reel, means for receiving a tape supply reel disposed in a housing, supply reel drive means for driving the supply reel, said means for receiving the supply reel housing being adapted to bring the supply reel into engagement with the supply reel drive means, and leader means extending from said take-up reel to said means for receiving the supply reel to engage the tape in the supply reel when the supply reel is brought into engagement with the drive means and serving to draw the tape from the supply reel housing over said drum to said take-up reel.

4,451,862

MAGNETIC HEAD MOUNTING MECHANISM FOR AUTOMATIC AZIMUTH CONTROL

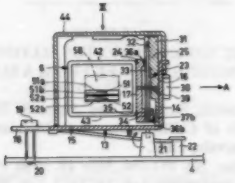
Albert M. A. Rijckaert, Eindhoven, Netherlands; Henricus M. Ruyten, Vienna, Austria; Johannes F. Hoefnagels, and Johannes J. M. Schoenmakers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 187,657, Sep. 16, 1980. This application Dec. 29, 1982, Ser. No. 454,212

Claims priority, application Netherlands, Sep. 28, 1979, 7907218

Int. Cl.³ G11B *5/56, 21/24*

U.S. Cl. 360—109 **30 Claims**



1. An apparatus for recording and/or reproducing information on a magnetic tape, comprising a frame portion, at least one head support arranged on said frame portion, a magnetic head having an air gap and carried on said head support, a magnetic shield for said head, and means for positioning the magnetic head with respect to the head support, said means comprising an electromechanical deflection element rigidly connected to the head support and having mounting portions, a mounting portion being connected to the magnetic head such that the magnetic head may be pivoted by the deflection element relative to the head support in order to adjust the azimuth angle position of the magnetic head,

characterized in that said shield encloses both the magnetic head and the deflection element, the deflection element being disposed in a space bounded by a wall of the magnetic head, and

said means further includes first and second holders for the deflection element, one of said holders being fixedly secured to the magnetic head and the other holder being fixedly secured to the head support, each said mounting portion of the deflection element being adjacent an opposite edge of the element and rigidly fixed to a respective one of said holders; a stop rigidly connected to the magnetic head; and another stop rigidly connected to the head support, said stops being so arranged that pivotal movement of the magnetic head relative to the head support is limited in both directions.

4,451,863

INFORMATION REPRODUCING APPARATUS BASED ON OPTO-MAGNETIC EFFECT

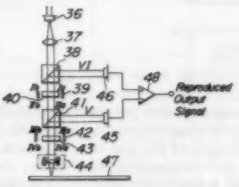
Tuneo Yanagida, and Kiichi Kato, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Japan

Filed Feb. 26, 1982, Ser. No. 352,525

Claims priority, application Japan, Mar. 5, 1981, 56-31517

Int. Cl.³ G11B *5/32, 7/00*

U.S. Cl. 360—114 **11 Claims**



1. An information reproducing apparatus for reading out information recorded on a reflective record medium based on an opto-magnetic effect, the apparatus comprising

a light source for generating a collimated light beam;

a first polarizing beam splitter arranged to receive the collimated light beam and having a polarizing axis extending in a given direction for converting the collimated light beam therethrough into a linearly polarized light beam;

a first Faraday element arranged to receive the light beam transmitted through the first beam splitter for rotating the polarizing direction of the linearly polarized light beam by an angle $\pi/4$;

a second polarizing beam splitter arranged to receive the light beam transmitted through the first Faraday element and having a polarizing axis slanted by an angle $\pi/4$ with respect to the polarizing axis of the first beam splitter;

a pick-up device arranged to receive the light beam transmitted through the second beam splitter for projecting and converging the light beam onto the reflective record medium and for picking up the reflected beam and passing it back to the first and second beam splitters;

a first photodetector arranged to receive the light beam reflected by the record medium and the second beam splitter; and

a second photodetector arranged to receive the light beam reflected by the record medium, transmitted through the second beam splitter and reflected by the first beam splitter.

4,451,864

MAGNETIC-TAPE CASSETTE

Arnold Prodinger, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,154

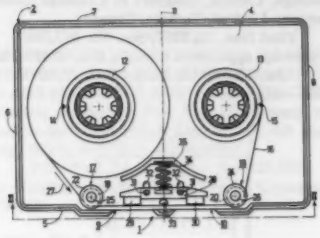
Claims priority, application Austria, Mar. 9, 1982, 941/82

Int. Cl.³ G11B *15/60*; G03B *1/04*

U.S. Cl. 360—130.33 **3 Claims**

1. A magnetic-tape cassette for storing information in the form of a plurality of information tracks on a magnetic tape, each track extending over less than the entire width of the tape, comprising a cassette side wall having at least one aperture therethrough, two winding hubs and a length of magnetic-tape wound on said hubs and extending past said aperture, an elastic pressure element located in the cassette, a support on which said element is arranged, and means for pressing said element against the tape so that the tape is pressed resiliently against the head face of a magnetic head which has been inserted through the aperture in such a way that the head face engages the magnetic-tape over the full tape width,

characterized by comprising two said pressure elements, each pressure element engaging only a part of the width of



the magnetic tape, the track to be scanned extending in said part.

4,451,865

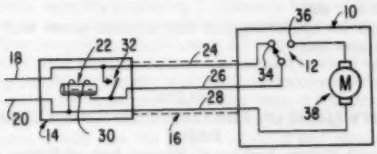
ELECTRICAL CUTOUT FOR UNDER VOLTAGE OR POWER LOSS CONDITIONS

Richard C. Warner, Morris Plains, N.J., and Thomas C. Laughon, Alpharette, Ga., assignors to The Singer Company, Stamford, Conn.

Continuation of Ser. No. 264,887, May 18, 1981, abandoned. This application Nov. 17, 1982, Ser. No. 442,488

Int. Cl.³ H02H *3/24, 7/09*

U.S. Cl. 361—23 **4 Claims**



1. In an electrically powered device, means for preventing the accidental starting-up of such a device by an ON-OFF switch being held in the ON state while the line cord is being plugged into the power socket, said means comprising no more than a single pair of current interrupting contacts electrically connected with said ON-OFF switch requiring that the ON-OFF switch be in or subsequently returned to the OFF position when power is applied to the tool, before the tool will respond to the ON-OFF switch being in the ON position; said ON-OFF switch comprising a single-pole, double-throw switch, having a guaranteed BREAK-BEFORE-MAKE characteristic and said current interrupting means comprises a relay having no more than a single MAKE (normally open) contact, the power being applied through line cord contacts connected across the relay coil through the trigger ON-OFF switch OFF contacts when the tool is plugged into the power supply with the switch in the OFF position.

4,451,866

METAL STRUCTURE GROUNDING SAFETY SYSTEM

Jean-Pierre Cinquin, Siccieu Saint-Julien, 38460 Cremieu; Jacques Danthony, 16ter Rue Greuze, 69100 Villeurbanne, and Charles Mulertt, 105 Rue Tete d'Or, 69006 Lyon, all of France

Filed Apr. 13, 1982, Ser. No. 367,854

Claims priority, application France, Apr. 15, 1981, 81 07739

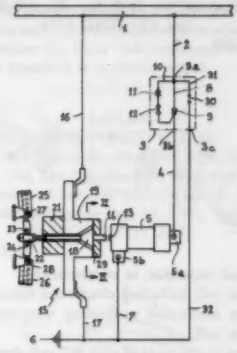
Int. Cl.³ H02H *9/04, 9/06*

U.S. Cl. 361—56 **4 Claims**

1. A system for grounding a metal structure if it should become electrically live to prevent risk of electrocution, comprising in combination:

(a) voltage detector means having an output and having an input connected to the structure and including semiconductor means having a low conduction threshold voltage;

(b) fuse cartridge means having a plunger rendered operative when the cartridge means is blown, said fuse cartridge means being connected to said output so that it is mounted in series with said semiconductor means between said structure and ground;



(c) a short-circuiting switch connected directly between said structure and ground, said switch being normally open;

(d) means actuated by said plunger to close said switch when said fuse cartridge means is blown; and

(e) spark gap means connected directly between said structure and ground, said spark gap means having a striking voltage not exceeding 100 volts.

4,451,867

ELECTRICALLY ACTUABLE IGNITION ASSEMBLY

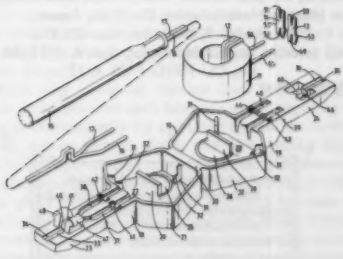
James Robertson, Irvine, Scotland, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 7, 1982, Ser. No. 415,542

Claims priority, application United Kingdom, Sep. 28, 1981, 8129283

Int. Cl.³ F42C *11/00;* **H01R** *9/08*

U.S. Cl. 361—248 **11 Claims**



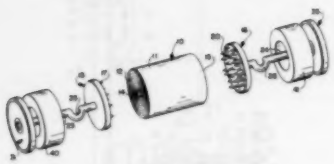
1. An electrically actuable ignition assembly comprising an encased resistive electric ignition element having two terminals and a length of electrical leading wire connected to each terminal, said wire lengths extending outside the case, the portions of wire outside the case being fully insulated, a transformer ring core having an insulated length of electrical conductor wire wound thereon as a secondary winding, and two electrically conducting metal contact elements each electrically connecting an end-portion of the secondary winding to a corresponding one of said lengths of electrical leading wire to complete an electrical circuit across said terminals, said

contact elements having portions penetrating the insulating layer on the respective wires and contacting the wire.

4,451,868
ELECTRICAL CAPACITOR

Stephen A. James, Hennepin County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 15, 1982, Ser. No. 398,484
Int. Cl.³ H01G 1/14
U.S. Cl. 361—306 **2 Claims**

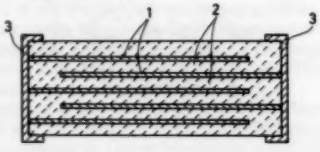


1. In a wound capacitor, in combination:
a capacitance roll including electrodes spaced by dielectric layers, the electrodes projecting separately to opposite ends of the roll;
a pair of discs at the ends of said roll and shaped to conform with the ends of said roll, each said disc having a first, roughened surface for intimately engaging the electrode at the end of said roll, and having a conductor extending generally axially away from a second surface thereof, each conductor having a strain relief offset spaced from said disc;
a housing for said capacitor comprising a tube with end closures and out of contact with said offset;
and means maintaining said discs in contact with the ends of said roll, including a tubular insulating spacer between each disc and the adjacent end closure of the tube and out of contact with said offset.

4,451,869
LAMINATED CERAMIC CAPACITOR

Yukio Sakabe, Kyoto; Goro Nishioka, Yawata; Yoshimasa Azuma, Kyoto, and Susumu Mori, Fukui, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 5, 1983, Ser. No. 491,887
Claims priority, application Japan, Apr. 4, 1983, 58-59852
Int. Cl.³ H01G 1/00, 4/12
U.S. Cl. 361—309 **4 Claims**

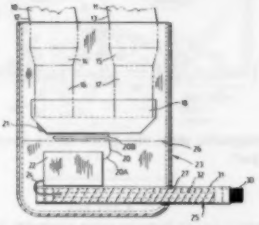


1. A laminated ceramic capacitor wherein a plurality of internal electrodes are formed in a laminated state with ceramic layers mutually held between each of two of the internal electrodes to give electrostatic capacity, and a pair of external electrodes are connected to the associated ones of said internal electrodes for taking out the electrostatic capacity, said laminated ceramic capacitor characterized by said ceramic layers being of non-reducing ceramics, said internal electrodes being composed of a base metal, and said external electrodes being of fired copper including zinc borosilicate glass.

4,451,870
CAPACITIVE SIGNAL COUPLER

Palmer Lonseth; Neil R. Selkirk, and Donald G. Moorby, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Nov. 22, 1982, Ser. No. 443,565
Claims priority, application Canada, Dec. 4, 1981, 391540
Int. Cl.³ H01G 9/00; H01L 27/02
U.S. Cl. 361—433 **6 Claims**

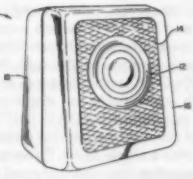


1. A capacitive signal coupler for coupling signals indicative of corona discharge from stator conductors of a dynamoelectric machine to a monitor system, comprising
insulating means for covering and insulating the ends of stator conductors connected by a connector,
a capacitor encapsulated in said insulation means and having first and second leads, said first lead being arranged for connection to said connector,
a high voltage fuse having a first and a second terminal means, and
means for connecting said first terminal means with said second lead.

4,451,871
SAFETY LIGHT OR THE LIKE WITH HIGH CURRENT DRIVE

J. Darrell Kirkley, and Joe C. Weaver, both of Dallas, Tex., assignors to Jog-O-Lite, Inc., Dallas, Tex.

Filed Sep. 29, 1982, Ser. No. 428,113
Int. Cl.³ F21L 7/00
U.S. Cl. 362—186 **8 Claims**



1. A safety light for athletes or the like to be recognized by oncoming vehicles comprising:
(a) a housing having a first lens member disposed therein and adapted to contain battery means;
(b) light generating means being contained within said housing for generating intermittened bursts of light which are visible exterior of said housing through said first lens member, said light generating means including a light source means having a predetermined maximum current rating and a position sensor means coupled in a series circuit with said battery means and said light source means, said position sensor means being positioned in said housing to normally provide an open circuit and to provide intermittent curent from said battery means to said light source means only when said housing is jiggled, and
(c) current control means in said series circuit with said light source and battery means, said current control means

providing predetermined current flow from said battery means through said light source means which is in excess of said predetermined maximum current rating.

4,451,872

PROCESS FOR THE MOST UNIFORM ILLUMINATION OF A SURFACE BY A COLLIMATED BEAM OF RAYS AND ARRANGEMENT FOR LASER DIAGNOSTIC

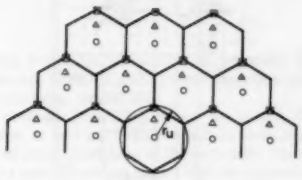
Heinz Hartwig, Niederzier, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,544

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044470

Int. Cl.³ F21V *5/02*

U.S. Cl. 362—251 4 Claims



1. Arrangement for the illumination of a target surface wherein the light intensities at each point of this surface are uniform, including projecting a collimated beam of light with arbitrary local distribution of the light intensities towards said surface; comprising a light source for projecting a collimated beam of light; a target surface receiving said beam of light and being illuminated thereby; a generally planoconvex polyhedral lens interposed in the path of the light beam at a distance from the target surface to be illuminated corresponding to the focal distance of said lens, the planar surface of said planoconvex lens being oriented to extend perpendicular to the direction of said light beam, said lens having the convex polyhedral surface thereof composed of congruent plane surface elements.

4,451,873

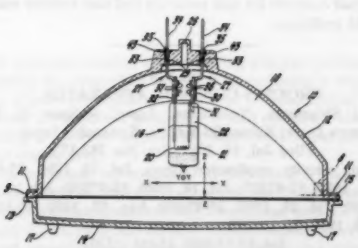
REFLECTOR FOR A SEALED BEAM LAMP

David O. Tyler, Anderson, and George M. Gasparovic, Pendleton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 128,674, Mar. 10, 1980. This application Mar. 29, 1982, Ser. No. 362,617

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—267 3 Claims



1. A reflector for supporting a tungsten-halogen lamp assembly having a light bulb connected to a plurality of terminals, said reflector including a parabolic reflective portion integrally formed with an upper wall and a lower wall, the rear central portion of said parabolic reflective portion being integrally formed with a boss having a substantially uniform thickness greater than the thickness of said parabolic reflective portion adjacent said boss, at least two cavities formed in the exterior portion of said boss; an opening formed in each of said cavities for receiving one of said terminals, each of said cavities being generally concave and stepped in cross-section and totally surrounds the associated opening, each of said openings being sized slightly larger than the cross-sectional configuration of said one of said terminals for allowing pivotal movement of said lamp assembly when said lamp assembly is being optically aimed relative to said reflector; said cavities adapted to accommodate an adhesive for fixing said terminals to said reflector after said lamp assembly is optically aimed.

4,451,874

EARTH PHOTO GLOBE

Jon Friedman, 312 Prince St., Freeport, N.Y. 11520

Division of Ser. No. 128,624, Mar. 10, 1980, Pat. No. 4,334,867, which is a division of Ser. No. 27,937, Apr. 6, 1979, Pat. No. 4,276,561. This application Sep. 14, 1981, Ser. No. 302,172

Int. Cl.³ F21V *3/00*

U.S. Cl. 362—285 11 Claims

1. A globe and support assembly therefor, comprising:

an arcuate support arm extending through at least 180°,

a base for said support arm,

a fixed mount situated on said support arm near one end thereof,

an adjustable mount situated on said support arm diametrically opposite said fixed mount and comprising a mounting bracket threadingly connected to said support arm and thereby threadingly moveable toward or away from said fixed mount,

said fixed and adjustable mounts each being independent from said globe and each having a globe engaging surface adapted respectively for clamping against the undisturbed outer surface of said globe, said globe being disposable within the arc of said support arm so that movement of said adjustable mount toward said fixed mount will clamp said globe between the globe engaging surfaces of said fixed and adjustable mounts, said globe being disposable at any orientation within said support assembly so that said mounts will clamp the outer surface of said globe either at the poles thereof or at any other set of diametrically opposite points.

4,451,875

POSTER PANEL LIGHTING FIXTURE

Herbert A. Odle; John D. Green, and Jan Shadwick, all of Newark, Ohio, assignors to Manville Service Corporation, Denver, Colo.

Filed Mar. 2, 1982, Ser. No. 353,997

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—297 9 Claims

1. A lighting fixture for mounting in front of a large panel

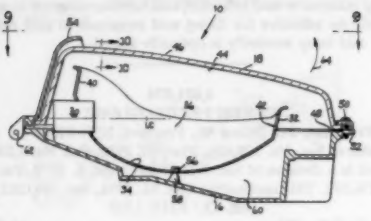
such as an advertising billboard and for illuminating the panel, the panel being of the type having a horizontal length approximately two times as long as its vertical length, comprising:

(a) a lamp housing;

(b) a generally horizontally positioned lamp contained within the lamp housing;

(c) means, attached to the lamp, for lighting the lamp;

(d) a reflector positioned on one side of the lamp and designed to reflect the light radiating from the lamp, the



reflector having a first generally linear translated bottom parabolic surface and further having two side surfaces formed parabolic in one direction through a horizontal section of the side surface; and

(e) a refractor, positioned on the lamp housing, to totally enclose the lamp from outside weather elements, the refractor comprising in part a combination of prism elements designed for three-phase light control of stray light and designed to refract, to reflect and finally to refract the stray light radiating from the lamp.

4,451,876

SWITCHING REGULATOR

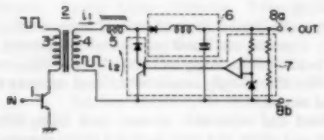
Yasunobu Ogata, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,861

Claims priority, application Japan, Jun. 19, 1981, 56-94781; Jun. 19, 1981, 56-94782; Jun. 19, 1981, 56-94783

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—21 **6 Claims**



1. A switching regulator of a magnetic amplifier type comprising:

a switching element connected in series with a primary winding of a transformer to be periodically turned on-off,

a saturable reactor including a core and coil wound around said core, said core including a sheet wound in spiral form, said saturable reactor being connected in series with a secondary winding of said transformer,

a rectifier circuit connected in series with said saturable reactor, and

a control circuit controlling a current of said saturable reactor for maintaining constant DC output voltage appearing across output terminals of said rectifier circuit, wherein the core of said magnetic material is formed of amorphous magnetic material having its sheet thickness lying within the range of 4 μm to 60 μm, and wherein said amorphous metallic magnetic material has a composition expressed by:

$M_aM'_bX_c$

where

M: at least one of Fe and Co,

M': a metallic element other than Fe and Co,

X: a nonmetallic element, in the conditions of $a \geqq 50$, $b \leqq 30$, $3 \leqq 30$, and

$a+b+c=100$.

4,451,877

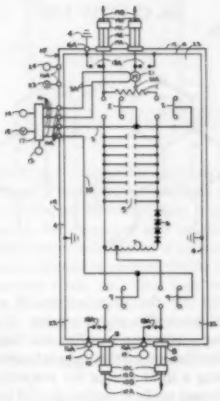
BATTERY SYSTEM

Paul F. Pugh, 4082 Sequoyah Rd., Oakland, Calif. 94605

Filed Sep. 10, 1981, Ser. No. 300,798

Int. Cl.³ H02M *3/18*

U.S. Cl. 363—59 **9 Claims**



1. A battery system comprising:

input conductors with insulation;

input switches connected in series to said conductors;

a step-up voltage transformer connected in parallel to said input switches;

rectifiers connected in series to said transformer to produce a direct current (DC) voltage (DCV);

a plurality of condenser plates connected in parallel to said rectifiers which are charged to a very high DCV;

output switches connected in series to said condenser plates;

an output variable resistor connected in parallel to said condenser plates;

an enclosure for said conductors, said input and output switches, said transformer, said rectifiers, said condenser plates, said output resistor;

said enclosure pressurized with an insulating gas; and

external controls for said switches and said resistor sealed in said enclosure.

4,451,878

PROCESS CONTROL APPARATUS

Takashi Shigemasa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 14, 1981, Ser. No. 283,173

Claims priority, application Japan, Jul. 18, 1980, 55-97596; Jul. 18, 1980, 55-97597; Jul. 18, 1980, 55-97598; Jul. 18, 1980, 55-97599; Jul. 18, 1980, 55-97600; Aug. 19, 1980, 55-113030; Nov. 28, 1980, 55-166793

Int. Cl.³ G05B *13/04, 17/02*

U.S. Cl. 364—151 **11 Claims**

1. A process control apparatus comprising:

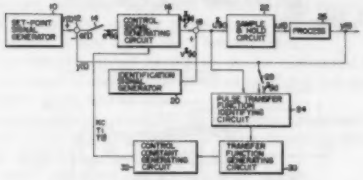
set-point signal generating means for generating a set-point signal of an output of said process;

controller means for controlling a process input of said process in accordance with control constants and a con-

trol error which is a difference between the set-point signal and said process output;

identification signal generating means for superimposing a persistently exciting identification signal on said process input;

identifying means for identifying a pulse transfer function of said process in accordance with said process input on which the persistently exciting identification signal is superimposed and said process output;



calculating means for calculating an S-transfer function of said process from the pulse transfer function identified by said identifying means; and

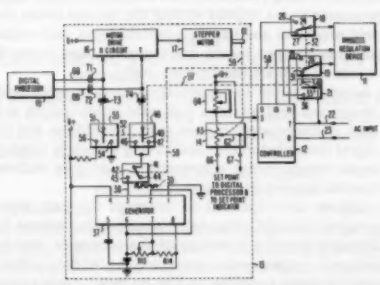
control constant generating means for tuning the control constants in said controller means in accordance with a result of model-matching of the S-transfer function calculated by said calculating means with an S-transfer function of a reference process model.

4,451,879

CIRCUIT FOR PROVIDING A COMMON SETPOINT FOR MANUAL AND AUTOMATIC REGULATION OF A PROCESS CONTROL SYSTEM

Norman D. Welch, and John W. Woestman, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,260
Int. Cl.³ G05B 7/02
U.S. Cl. 364—181 **4 Claims**



1. In a process control system having a digital processor for optimizing the controlled process and including a regulation device selectively regulated manually or automatically by a controller to regulate a parameter of said process, a circuit for providing a common setpoint for both manual and automatic control comprising:

variable voltage input means for providing a variable setpoint to said controller and to said digital processor;

generator means for providing a repetitive output signal;

means for varying said variable voltage input means to vary said setpoint, said means for varying being selectively responsive to said digital processor and to said repetitive output signal;

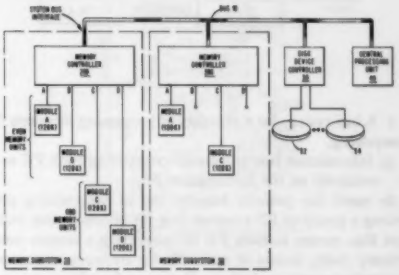
switch means for selecting said manual and automatic control whereby said means for varying is responsive to said digital processor during automatic control and is responsive to said repetitive output signal during manual control, said switch means including a first plurality of switches arranged between said controller and said regulation device and a second plurality of switches arranged between said generator means and said means for varying, one portion of said first and second pluralities of switches being simultaneously actuatable for automatic control and another portion of said first and second pluralities of switches being simultaneously actuatable for manual control.

4,451,880

MEMORY CONTROLLER WITH INTERLEAVED QUEUING APPARATUS

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 31, 1980, Ser. No. 202,821
Int. Cl.³ G06F 13/00
U.S. Cl. 364—200 **29 Claims**



22. A memory controller for use in a system including a plurality of request generating units coupled to a bus in common with said controller, said controller being coupled to a plurality of memory modules and said controller being operative to control the operation of said plurality of memory modules in response to a plurality of different types of memory requests generated by said units, said requests including predetermined types of requests, each of which is coded to specify a predetermined type of memory operation requiring the read out of a plurality of data word pairs over successive memory cycles of operation, said controller comprising:

a pair of queue circuit means each circuit means being coupled in common to said plurality of memory modules and to said bus for receiving and storing a different one of said plurality of different types of memory requests, each of said queue circuit means being operative to store each request for the number of memory cycles to complete the processing thereof and said each queue circuit means in response to each request being operative to control the operation of said plurality of memory modules as required for said processing of said requests stored therein; and,

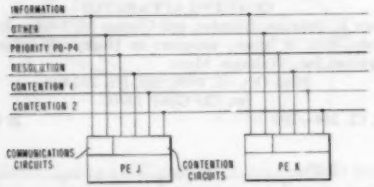
queue control means coupled to each of said pair of queue circuit means and to said bus, said queue control means including tristate control circuit means responsive to signals received from said bus indicative of the type of requests stored and the occupancy of said pair of queue circuit means for alternately enabling different ones of said pair of queue circuits for controlling the operation of said plurality of memory modules for concurrently processing said different ones of said memory requests during alternate memory cycles of operation so as to eliminate delays in processing memory request requiring only a single memory cycle of operation to complete.

4,451,881

DATA PROCESSING SYSTEM BUS FOR MULTIPLE INDEPENDENT USERS

Donald G. Grice, Kingston, and Frank E. Howley, Poughkeepsie, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 3, 1981, Ser. No. 317,824
Int. Cl.[3] G06F *3/04, 15/16, 9/46*
U.S. Cl. 364—200 12 Claims



1. A bus system for a plurality of processing elements (PE's) comprising,

an Information Bus and means connecting each PE to communicate on the Information Bus,

1a multi line priority bus for use in determining priority among a group of PE's contending for access to said Information Bus, means in each PE for providing a unique multi bit priority code, means in each PE for defining a sequence of contention stages, including a first stage for which one or more PE's initiate a contention sequence and a last stage in which one contending PE is assigned access to said Information Bus, means in each PE operable at each stage to put a corresponding part of said priority code on the priority bus and means in each PE to compare the code part of the PE with code parts of other PE's on the bus during the same stage of contention and to signal the PE to drop out of the contention sequence if it is NOT HIGH,

a further plurality of lines for use in defining a group composed of PE's that initiate a contention sequence, one or more contention sequences among members of a group constituting a group contention period, and for use in allowing access to said priority bus to all members of the group (GROUP MODE) or a selected one (TOP MODE) or selected ones (TASK MODE) of a group during a group contention period and

means in each PE for signalling on a first of said further plurality of lines (RESOLUTION) its use or non-use of the Information Bus and for signalling on a second of said lines (CONTENTION 1) that it is in a process of contention for access to the Information Bus and for signalling on a third of said lines (CONTENTION 2) that it is contending as a member of a group to be given access to the bus during the group contention period

means in each PE for detecting the corresponding signals of other PE's on said further plurality of lines and

means in each PE responsive to said detecting means and operable when a PE is a member of the group to inititate a next contention sequence on the fall of the signal on said first and second lines, and means to prevent a PE from entering contention during a group contention period unless it is a member of the group initiating the sequence,

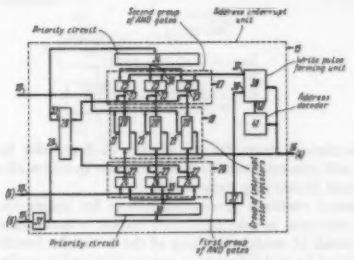
whereby each PE handles access to the bus equally without a separate controlling element.

4,451,882

DATA PROCESSING SYSTEM

Valery L. Dshkhunian, K-482, korpus 338-A, kv. 73; Eduard E. Ivanov, 14 Parkovaya ulitsa, 16, kv. 6; Sergei S. Kovalenko, K-498, korpus 421, kv. 3; Pavel R. Mashevich, K-482, korpus 338-A, kv. 139; Alexei A. Ryzhov, K-527, korpus 848, kv. 63; Vyacheslav V. Telenkov, K-527, korpus 811, kv. 75, and Jury E. Chicherin, K-460, korpus 161, kv. 31, all of Moscow, U.S.S.R.

Filed Nov. 20, 1981, Ser. No. 323,276
Int. Cl.[3] G06F *9/18, 9/16, 15/16*
U.S. Cl. 364—200 3 Claims



1. A data processing system for handling multiple tasks and comprising: at least two processors intended for data processing; a memory unit for storing programs and data; an input-/output unit; and a data address and control signal transmission line connected to said processors, said memory unit and said input/output unit;

wherein each of said processors comprises:

an arithmetic-logic unit performing arithmetic and logic operations in the course of data processing and having a control input and an input/output means;

a scratch pad memory storing intermediate results in the course of data processing and having a control input;

a processor status register storing the current status word of said processor and having a control input, and output and an input/output means connected to said input/output means of said arithmetic-logic unit;

an interface means to ensure interaction between said processor and said memory unit, said input/output unit and each of the processors over said data address and control signal transmission line, and having a control input and an input/output means connected to said data address and control signal transmission line;

an address interrupt unit to interrupt the execution of a program by said processor through using means for addressing memory locations of the processor, and having an input/output means connected to said data address and control signal transmission line, an input, a first output and a second output;

a control unit to form signals to control said arithmetic-logic unit, said scratch pad memory, said interface means, said processor status register and said address interrupt unit in the course of data processing, and having a first control output connected to said control inputs of said arithmetic-logic unit, said scratch pad memory, said interface means and said processor status register, a first input connected to said output of said processor status register, a second input connected to said second output of said address interrupt unit, and a second control output connected to said input of said address interrupt unit; and

a processor data bus to interconnect said arithmetic-logic unit, said scratch pad memory, said processor status register and said interface means, and connected to said first output of said address interrupt unit;

wherein said address interrupt unit comprises:

a group of interrupt vector registers, each of said interrupt

vector registers having an input connected to said input-/output means of said address interrupt unit, an output connected to said first output of said address interrupt unit, a first control input and a second control input;

a first group of AND gates, each of said AND gates having an output connected to said first control input of a respective register of said group of interrupt vector registers, a first input, and a second input connected to said input of said address interrupt unit;

a second group of AND gates, each of said AND gates having an output connected to said second control input of a respective register of said group of interrupt vector registers, a first input, and a second input;

a first priority circuit having an output connected to said first input of each of said AND gates of said first group of AND gates, and an input;

a second priority circuit having an output connected to said first input of each of said AND gates of said second group of AND gates, and an input;

an AND gate having an input and an output;

an OR gate having an output connected to said second output of said address interrupt unit, and an input;

a status register having a first input connected to said outputs of each of said AND gates of said first group of AND gates, a second input connected to said outputs of each of said AND gates of said second group of AND gates, a first output connected to said input of said first priority circuit, to said input of said AND gate and to said input of said OR gate, and a second output connected to said input of said second priority circuit;

a write pulse forming unit having a first input connected to said output of said AND gate, an output connected to said second input of each of said AND gates of said second group of AND gates, an input/output means connected to said input/output means of said address interrupt unit, and a second input; and

an address decoder having an output connected to said second input of said write pulse forming unit, and an input connected to said input/output means of said address interrupt unit.

4,451,883

BUS SOURCING AND SHIFTER CONTROL OF A CENTRAL PROCESSING UNIT

Philip E. Stanley, Westboro; William E. Woods, Natick; Richard A. Lemay, Carlisle, and David E. Cushing, Chelmsford, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 1, 1981, Ser. No. 326,260

Int. Cl.³ G06F *9/12, 9/20*

U.S. Cl. 364—200 **12 Claims**

1. A central processing unit for receiving instruction signals and operand signals from a memory subsystem and performing a shifting operation on said operand signals in accordance with said instruction signals, said central processing unit comprising:

a control store responsive to said instruction signals for generating a plurality of control signals;

shift distance control means including storage means responsive to a first plurality of said plurality of control signals for generating a plurality of shift control signals,

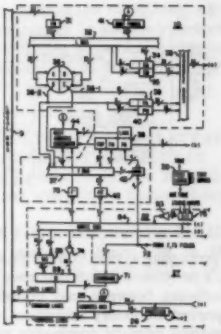
and logic means responsive to said plurality of shift control signals for generating a plurality of shift signals indicative of a number of bit positions said operand signals are shifted during said shifting operation;

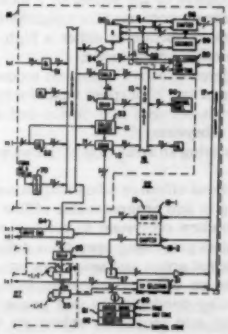
selector means coupled to a first bus for storing said operand signals received from said memory subsystem and responsive to said plurality of shift control signals for generating a plurality of first bus signals representative of said operand signals for transfer over said first bus;

shifting means coupled to said first bus and receiving said plurality of first bus signals representative of a first operand word and responsive to said plurality of shift signals in a first state for generating a plurality of multiplexer signals representative of said first operand word;

register means responsive to said plurality of shift control signals for storing said plurality of multiplexer signals and generating a plurality of register signals during a first cycle of said control store operation;

said shifting means further receiving said plurality of first bus signals representative of a second operand word and said plurality of register signals representative of said first operand word and responsive to said plurality of shift signals in a second state for transferring said second operand word to a second bus and generating a plurality of second bus signals shifted from said first bus signals and generating said plurality of multiplexer signals shifted from said register signals by the number of bit positions specified by said plurality of shift signals in said second state during a second cycle of said control store operation; and





shift end means for receiving a plurality of first end signals of said plurality of first bus signals representative of said second operand word and a plurality of second end signals of said plurality of register signals and responsive to a second plurality of control signals indicative of a type of shift and said plurality of shift control signals for generating first shift end signals representative of said plurality of first end signals and second shift end signals representative of said plurality of second end signals when said second plurality of control signals indicates a circular shift,

and generating said first and said second shift end signals at binary ZERO when said second plurality of control signals indicates an open shift;

said shifting means being responsive for shifting said first shift end signals for generating said plurality of multiplexer signals and shifting said second shift end signals for

generating said plurality of second bus signals during said second cycle of operation wherein said plurality of second bus signals and said plurality of multiplexer signals are shifted from said plurality of first bus signals and said plurality of register signals by the number of bit positions specified by said plurality of shift signals in said second state.

4,451,884

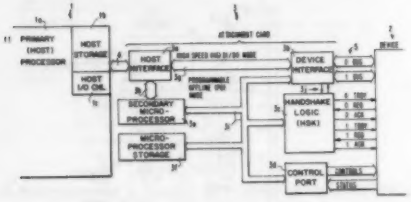
CYCLE STEALING I/O CONTROLLER WITH PROGRAMMABLE OFFLINE MODE OF OPERATION

Chester A. Heath, and Richard G. VanDuren, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,101

Int. Cl.³ G06F *9/22, 13/00, 15/06, 15/20*

U.S. Cl. 364—200 **8 Claims**



1. In a data processing system containing a primary processing subsystem, a peripheral device and a secondary processing subsystem interfacing between said primary subsystem and device, an improved secondary subsystem comprising:

means for storing primary commands received from said primary subsystem;

means responsive to the setting of a mode bit in each said stored primary command for conditioning said secondary subsystem to operate in either a high speed mode or a programmable offline mode;

means rendered effective when said secondary subsystem is operating in said high speed mode for transferring data at high speeds between said device and a memory in said primary subsystem;

means for storing an array of multiple secondary commands; and

means rendered effective when said secondary subsystem is operating in said programmable offline mode for causing said secondary subsystem to perform a program of secondary data processing operations defined by commands in said stored array; said secondary operations being conducted in an offline relationship to operations concurrently being conducted in said primary subsystem, and permitting said secondary subsystem to exchange data with either said device or a memory in said primary subsystem and to process said data without assistance or direction from said primary subsystem.

4,451,885

BIT OPERATION METHOD AND CIRCUIT FOR MICROCOMPUTER

Isadore S. Gerson, Austin, and Willard S. Briggs, Carrollton, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Mar. 1, 1982, Ser. No. 353,602

Int. Cl.³ G06F *7/00*

U.S. Cl. 364—200 **3 Claims**

1. A bit operation method for a microcomputer which has an arithmetic logic unit (ALU) connected to communicate through a bus, the method comprising the steps of:

(a) loading a bit test instruction into an instruction register,

(b) transferring a first operand from a first register to a bit test circuit,

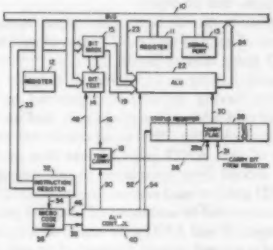
(c) transferring a first mask word from said instruction register to said bit test circuit,

(d) selecting a bit from said first operand by operation of said bit test circuit in accordance with said first mask word,

(e) transferring said selected bit from said bit test circuit to a selected bit location,

(f) loading a bit copy instruction into said instruction register to carry out a bit copy from said first operand to a second operand,

(g) transferring said second operand from a second register to said ALU,



(h) transferring a second mask word from said instruction register to said ALU,

(i) transferring said selected bit from said bit location to said ALU,

(j) entering said selected bit into said second operand in accordance with said second mask word by operation of said ALU, and

(k) transferring said second operand, having said selected bit therein, from said ALU through said bus to said second register thereby copying said selected bit from said first operand to said second operand in response to said instruction.

4,451,886

BUS EXTENDER CIRCUITRY FOR DATA TRANSMISSION

David H. Guest, Balerno, and Peter R. Roubaud, Kirkliston, both of Scotland, assignors to Hewlett-Packard Limited, South Queensferry, Scotland

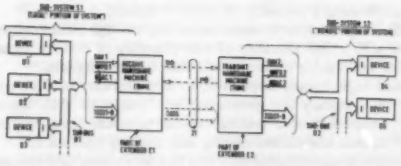
Continuation of Ser. No. 258,219, Apr. 27, 1981, abandoned.

This application May 26, 1983, Ser. No. 498,038

Claims priority, application United Kingdom, Apr. 30, 1980, 8014288

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **12 Claims**



1. An extender circuit for transmitting a byte of data across a distance between a first sub-bus and a second sub-bus, the extender circuit comprising:

first handshake means coupled to the first sub-bus;

second handshake means, coupled to the first handshake means and to the second sub-bus, for determining that the

second sub-bus is ready for the byte of data and for so indicating to the first handshake means;

transmission means for carrying the byte of data across the distance;

first data means, coupled to the first handshake means and controlled thereby, for selectably coupling the first sub-bus to the transmission means;

second data means, coupled to the second handshake means and controlled thereby, for selectably coupling the second sub-bus to the transmission means;

wherein the first handshake means is operative for receiving an indication from the second handshake means that the second sub-bus is ready for the byte of data, for indicating to the first sub-bus that the second sub-bus is ready for the byte of data, for determining that the byte of data is present on the first sub-bus and, responsive to said reception and determination, for causing the first data means to couple the first sub-bus to the transmission means and for thereafter indicating to the second handshake means that the byte of data is present on the transmission means; and

wherein the second handshake means is further operative for receiving an indication from the first handshake means that the byte of data is present on the transmission means and, responsive thereto, for causing the second data means to couple the transmission means to the second sub-bus and thereafter for indicating to the second sub-bus that the byte of data is present on the transmission means.

4,451,887

SYSTEM FOR CONTROLLING A DOOR AND DRIVER'S SEAT OF VEHICLE

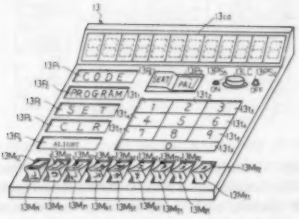
Kuniyoshi Harada, Takahama; Nobuyasu Suzumura, and Naofumi Fujie, both of Tokyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 29, 1981, Ser. No. 268,526

Claims priority, application Japan, Jun. 13, 1980, 55-79815

Int. Cl.³ G06F *15/20*; B60N *1/02*

U.S. Cl. 364—424 **5 Claims**



1. A system for controlling a door and driver's seat of a vehicle comprising:

a portable code emitter including a plurality of switches and a code generator for producing a code indicative of a particular switch operated;

a receiver mounted on a vehicle for receiving said code;

a plurality of key switches mounted on said vehicle for indicating and instructing a code, a registration command and an attitude information store command;

an automatic seat adjusting mechanism mounted on said vehicle and including at least one electric motor;

driver means for energizing each of said motors of said seat adjusting mechanism;

an attitude information generator connected to said seat adjusting mechanism for producing a signal indicative of the attitude of a seat;

a door lock controlling device mounted on said vehicle; and

an electronic control unit connected to said receiver, said plurality of key switches said driver means, said attitude information generator and said door lock controlling device;

said electronic control unit comprising electronic processor means and memory means including a read only memory, a read-write memory and a non-volatile, read-write memory;

said electronic control unit storing said code indicated with said key switches as a door unlocking code at a predetermined address of the non-volatile, read-write memory in response to a registration command entered with said key switches;

said electronic control unit storing the attitude information produced by said attitude information generator at an address of the non-volatile, read-write memory in response to an attitude information store command entered with said key switches, the address corresponding to said door unlocking code stored in the non-volatile, read-write memory; and

said electronic control unit energizing said door lock controlling device for an unlocking operation when the portable code emitter produces a code which coincides with said door unlocking code stored in the non-volatile, read-write memory, reading out the attitude information at the address corresponding to said door unlocking code and energizing the driving means for establishing the attitude of the seat as indicated by the read attitude information.

4,451,888

SPEED CONTROL METHOD AND APPARATUS FOR AUTOMOTIVE VEHICLES

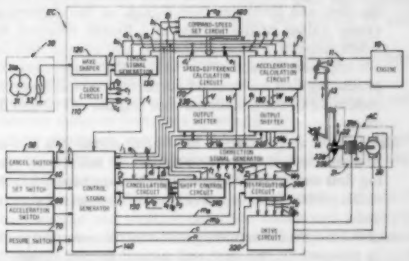
Akira Kuno, Oobu; Takeshi Matsui, and Yoshio Shinoda, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 6, 1981, Ser. No. 232,221

Claims priority, application Japan, Feb. 18, 1980, 55-19628

Int. Cl.³ B60K *31/00*; F02D *5/00*

U.S. Cl. 364—426 **5 Claims**



1. A speed control apparatus for an automotive vehicle driven by an internal combustion engine under control of control means for controlling the quantity of fuel supplied into said engine, the control apparatus comprising:

first means for repetitively producing a timing signal with a period of time responsive to the actual speed of the vehicle;

second means for producing a command signal indicative of a predetermined period of time defined by a desired speed of the vehicle;

third means responsive to the timing signal for calculating a first time difference between the predetermined period of time and the actual period of time of the timing signal and for producing a first difference binary coded signal indicative of an absolute value of the calculated first time difference and a first sign signal indicative of one of positive and negative signs of the calculated first time difference;

fourth means responsive to the timing signal for calculating a second time difference between the respective actual periods of time of the preceding and following timing signals and for producing a second difference binary coded signal indicative of an absolute value of the calcu-

lated second time difference and a second sign signal indicative of one of positive and negative signs of the calculated second time difference;

fifth means responsive to the timing signal for generating a first shift control signal when the actual period of time of the timing signal represents a value in a predetermined low speed range and for generating a second shift control signal when the actual period of time of the timing signal represents a value in a predetermined high speed range;

sixth means responsive to the first shift control signal for detecting the absolute value of the first difference binary coded signal in its low resolving power related to the predetermined low speed range and for producing a first detected signal indicative of the detected absolute value, said sixth means being responsive to the second shift control signal for detecting the absolute value of the first difference binary coded signal in its high resolution related to the predetermined high speed range and for producing a second detected signal indicative of the detected absolute value;

seventh means responsive to the first shift control signal for detecting the absolute value of the second difference binary coded signal in its low resolving power related to the predetermined low speed range and for producing a third detected signal indicative of the detected absolute value, said seventh means being responsive to the second shift control signal for detecting the absolute value of the second difference binary coded signal in its high resolving power related to the predetermined high speed range and for producing a fourth detected signal indicative of the detected absolute value;

eighth means responsive to the timing signal for calculating either one of the sum of values of the first and third detected signals or the sum of values of the second and fourth detected signals when respective signs of the first and second sign signals are identical to each other and for calculating either one of the difference between values of the first and third detected signals or the difference between values of the second and fourth detected signals when respective signs of the first and second sign signals are opposite to each other, said eighth means selectively producing first and second correction signals respectively indicative of the calculated sum and the calculated difference;

ninth means responsive to the timing signal and one of the first and second correction signals for selectively producing first and second output signals respectively in relation to the positive and negative signs of the second sign signal; and

actuator means for actuating said control means respectively in response to the first and second output signals to increase and decrease the quantity of fuel supplied into said engine.

4,451,889

ANTI-LOCK DEVICE FOR REGULATING THE BRAKE PRESSURE OF VEHICLE BRAKES

Heinrich Beckmann; Jens Ottersbach, both of Minden; Willibald Roider, Neufahrn, and Eckart Saumweber, Gauting, all of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

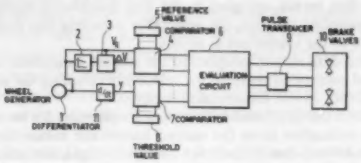
Filed Sep. 30, 1981, Ser. No. 306,887

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039574; Feb. 11, 1981, 3104876

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **5 Claims**

1. An anti-lock device for vehicle brakes comprising means connected to a wheel of a vehicle for generating a signal indicative of the wheel speed, means for generating a reference signal indicative of the speed of the vehicle, differentiating means for generating a proportional signal being proportional to one of the acceleration and deceleration of the wheel, comparator means for comparing the wheel speed signals, the reference signals and the proportional signals with predetermined threshold values and having an output, and an evaluation circuit connected to the output of said comparator means



to maintain the brake pressure constant during a start phase of the braking operation after the wheel acceleration falls below a first negative acceleration threshold.

4,451,890

AUTOMATIC SPEED CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kouichi Suzuki, and Kazuyuki Mori, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

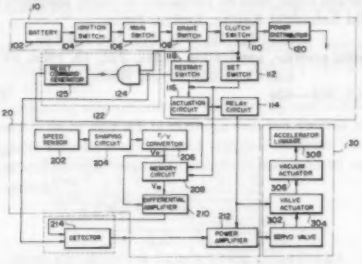
Filed Jan. 15, 1981, Ser. No. 225,371

Claims priority, application Japan, Jan. 18, 1980, 55/3657

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.³ B60K *31/00*

U.S. Cl. 364—426 **22 Claims**



20. A system for automatically controlling the speed of a vehicle including acceleration means, deceleration means, such as a brake or clutch, and speed sensing means comprising memory means; set switch means coupled to the deceleration means; said set switch means, when activated, being responsive to the deceleration means for setting a desired speed for the vehicle into the memory means; means connected to be responsive to the memory means and the speed sensing means for deriving an error signal indicative of the deviation between the desired set speed and the sensed speed; a power amplifier connected to provide a signal to said acceleration means and having a power supply terminal associated therewith; a logic circuit responsive to the error signal and a logic signal, the logic circuit coupling the error signal to and decoupling the error signal from an input of the power amplifier in response to the logic signal respectively having first and second values; a power supplying circuit for selectively supplying power to and removing power from the power supply terminal; a resume switch means having a normal off state and an operator activated on state, said resume switch means normally being in said operator activated on state only for the duration of operator activation; the power supplying circuit being connected to be responsive to the set switch means, the resume switch means and the deceleration means so that the power is continuously supplied to the power supply terminal in response to activation of the set switch means and in response to changing of the

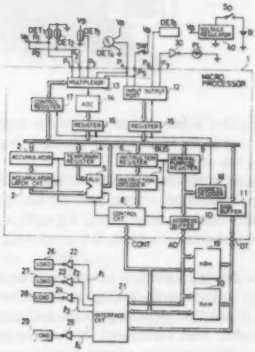
resume switch means state from the on state to the normal off state and so that power is removed from the power supply terminal in response to activation of the deceleration means; and means responsive to the resume switch means being respectively in the off and on states for deriving the first and second logic values, whereby in response to the resume switch means being defective so that it remains in the on state after termination of operator activation and after deactivation of the decelerator means, no error signal is supplied by the amplifier to the accelerator means.

4,451,891

DIGITAL SEMICONDUCTOR INTEGRATED CIRCUIT AND DIGITAL CONTROL SYSTEM USING THE SAME

Shirou Baba, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1981, Ser. No. 231,923
Claims priority, application Japan, Feb. 20, 1980, 55-18986
Int. Cl.³ G05B *11/01*; G06F *15/00*
U.S. Cl. 364—431.12 **6 Claims**



1. An integrated circuit having a plurality of external terminals for coupling signals to and from said circuit comprising:

a digital signal input circuit contained within said circuit having at least one digital signal input coupled to one or more of said plurality of external terminals and at least one digital signal output coupled to one of said external terminals;

an analog signal input circuit contained within said circuit having at least one analog signal input coupled to one or more of said plurality of external terminals;

at least one of said external terminals being coupled in common to said analog and said digital signal input circuits;

control means for selectively coupling either analog input signals applied to said one or more common terminals to said analog input signal circuit or digital input signals applied to said one or more common terminals to said digital input signal circuit; and

an internal bus line; and wherein

said digital signal input circuit has a switching means for selectively coupling said digital signal inputs to said internal bus line;

said analog signal input circuit has switching means for selectively coupling said analog signal inputs to said internal bus line; and

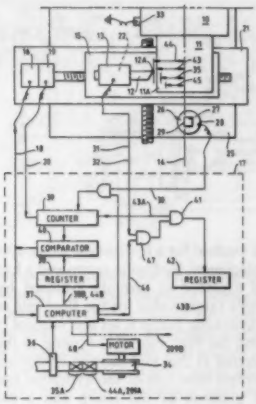
the switching states of the digital and analog signal switching means being controlled by said control means.

4,451,892

METHOD OF AND APPARATUS FOR MEASURING DISTANCES IN NUMERICALLY CONTROLLED MACHINE TOOLS

David R. McMurtry, 'Undercroft', Tabernacle Pitch, Wotton-Under-Edge, Gloucestershire, England

Filed Jan. 27, 1981, Ser. No. 229,052
Claims priority, application United Kingdom, Jan. 31, 1980, 8003285
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **13 Claims**



13. A numerically controlled machine tool comprising

a first member for supporting a workpiece;

a second member for supporting a cutting tool, said cutting tool being provided for machining the surface of said workpiece to a desired distance from a datum plane;

motor means for displacing said first and second members with respect to each other;

storage means for storing a first signal corresponding to said desired distance from said datum plane;

position detection means for generating a second signal corresponding to the displacements of said first and second members relative to each other;

comparator means having inputs coupled to the outputs of said storage and position detection means and an output coupled to said motor means, said comparator means driving said motor means to displace said first and second members with respect to each other until said first and second signals are equal;

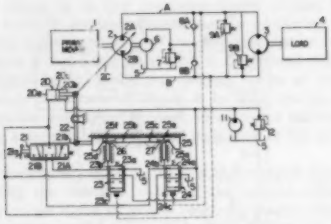
sensing means coupled to said first and second members for determining when said cutting tool and workpiece became disengaged from each other, said sensing means generating a third signal corresponding to the distance of the surface of said workpiece from said datum plane upon said disengagement;

computer means coupled to said storage and sensing means for generating a deflection signal corresponding to the difference between said third and first signals, said difference being a deflection signal corresponding to the relative deflection between said cutting tool and said workpiece, said computer means further generating a fourth signal equal to the difference between said first signal and said deflection signal and inputting said fourth signal to said storage means, whereby said comparator drives said motor means to displace said first and second members with respect to each other until said fourth and second signals are equal to each other, said cutting tool thereby machining the surface of said workpiece to the desired distance from said datum plane.

4,451,893
CONTROL METHOD AND CONTROL SYSTEM FOR HYDROSTATIC DRIVE SYSTEM

Eiki Izumi; Hiroshi Watanabe; Yukio Aoyagi; Kazuo Honma, and Kichio Nakajima, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 311,969
Claims priority, application Japan, Oct. 17, 1980, 55-144280
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—494 **10 Claims**



1. A control method for a hydrostatic drive system including a variable displacement hydraulic pump and a hydraulic actuator connected together to provide a closed hydraulic fluid circuit, wherein a target value for the flow rate of the variable displacement hydraulic pump is set and control of the pump is effected to bring the flow rate of the pump to the target value level, characterized in that said method comprises the steps of:

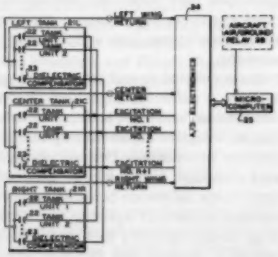
sensing a current flow rate of the hydraulic pump, a current discharge pressure of the pump and a current suction pressure thereof; and

controlling a rate of change in the flow rate of the hydraulic pump in such a manner that the discharge pressure does not exceed a first set of preset values with respect to the flow rate of the pump when the target value lies in a direction in which the flow rate of the pump is increased and the suction pressure does not exceed a second set of preset values with respect to the flow rate of the pump when the target value lies in a direction in which the flow rate of the pump is decreased.

4,451,894
LIQUID GAGING SYSTEM MULTIPLEXING

William R. Dougherty, St. Anthony; Dwight D. Colby, Roseville; Jerome A. Fahley, Fridley, and Martin J. Van Dyke, Brooklyn Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 149,798, May 14, 1980, abandoned. This application May 25, 1983, Ser. No. 496,984
Int. Cl.³ G01F *23/00*
U.S. Cl. 364—509 **35 Claims**



1. In a liquid gaging system, apparatus for monitoring individual sensors one at a time, comprising:

a plurality of sensors, each sensor providing a range of liquid measurement signals relating to liquid depth at a particular location in a tank; and

means for selectively monitoring individual sensors one at a time for a unique signal in the range relating to actual liquid depth at the particular location in the tank, the means for selectively monitoring being connected to the sensors.

4,451,895
INTERACTIVE COMPUTER AIDED DESIGN SYSTEM

Joseph Sliwkowski, Sudbury, Mass., assignor to Telesis Corporation of Delaware, Inc., Wilmington, Del.

Continuation of Ser. No. 167,821, Jul. 17, 1980. This application Jun. 9, 1983, Ser. No. 501,550
Int. Cl.³ G06F *3/37, 3/153*
U.S. Cl. 364—521 **11 Claims**

1. A computer aided design system for creating a design on a graphics screen by instructions entered through a separated function screen comprising:

a work station having a work surface including within said surface a function screen and further having, extending vertically above said surface, a graphics screen, separate from said function screen, for displaying a design in creation;

means for driving a portion of said function screen to display a mode selection including a selection of a keyboard mode, a position denoting mode and plural other modes for symbol and associated parameter selection and for driving other portions of said function screen with selectable design information associated with a selected mode;

point and pick means for selecting a point and corresponding mode or associated design information on said function screen;

means responsive to selection of a point on said function screen portion corresponding to one of said mode selections for changing the display mode of said function screen to produce a display enabling point and pick selection of information corresponding to the mode selected wherein,

the selection of the keyboard mode results in the display of a simulated keyboard from which point and pick selection of keyboard character design information may be made, and

the selection of the position mode results in the availability of the function screen to be used to select position design information thereon with said point and pick means that designates corresponding positions on the graphics screen, and wherein

the selection of one or more symbol selection modes by said point and pick means results in the function screen displaying selections of graphic element design information and parameters associated therewith;

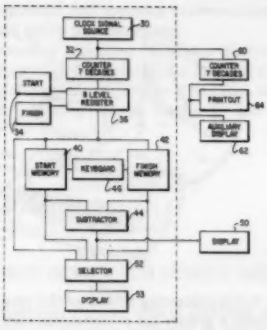
said system further including a means for producing design displays on said graphics screen in response to mode and associated design information selections made through said function screen by operation of said point and pick means.

4,451,896

ELECTRONIC CHRONOMETER

Andre Pomerleau, and Jean-Francoys Brousseau, both of Quebec, Canada, assignors to Universite Laval, Ste-Foy, Canada

Filed Jul. 14, 1981, Ser. No. 283,138
Claims priority, application Canada, Jul. 14, 1980, 356151
Int. Cl.³ G06F 15/28
U.S. Cl. 364—569 17 Claims



1. A numerical timing apparatus for sporting events such as marathons and the like races involving a large number of participants progressing on the same track between a starting gate and a finish line but not necessarily crossing the starting gate simultaneously, comprising:

a. signal means to produce an electrical signal which coincides in time with the lowering of the starting gate for one or more participants or the crossing of the finish line by any participant;

b. a multiple level register intended for the temporary registration of all starting times and of all finish times, including those happening in close succession;

c. an oscillator and decade counters group for producing a clock signal throughout said competition, said clock signal incorporating time information and being adapted to be applied to said register in response to said electrical signal;

d. starting time memory means coupled to the output of said register and used to store every starting time registered;

e. finish time memory means coupled to the output of the said register for storing every finish time registered in said register;

f. manual keying address means associated with said starting time and finish time memory means and operated throughout said sporting event for keying in the participant's identification codes whose recorded times are being retrieved from said register and stored in one of said memory means;

g. means for the subtraction of digital values intended for selectively subtracting for any one of said participants the starting time stored in said starting memory means from the current clock signal, or alternatively, from the participant's registered or stored finish time; and

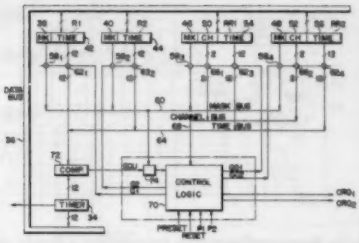
h. means for decoding and displaying the data furnished by said subtraction means thereby giving a visual indication of the track time of any one of the participants during the competition, and the final time when that participant crosses the finish line.

4,451,897

CONTROL DEVICE WITH MODE FLAGS FOR DEDICATING MEMORY SEGMENTS AS EITHER SCRATCHPAD OR TIMING CONTROL REGISTERS

Yutaka Murao, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1981, Ser. No. 274,808
Claims priority, application Japan, Jun. 23, 1980, 55-84906
Int. Cl.³ G06F 3/00, 13/00, 15/20
U.S. Cl. 364—900 22 Claims



1. An output control device for requesting output control signals on a plurality of output channels, comprising:

(A) storing means for storing output time data designating the desired time to produce an output control signal and mask data designating whether said storing means is dedicated for use as a register which holds said output time data or is free to be used as working random access memory;

(B) first means connected to said storing means for retrieving said mask data and said output time data stored in said storing means;

(C) a timer for producing a value representative of absolute time;

(D) comparing means connected to said timer and said storing means for comparing the contents of said timer with said output time data retrieved by said first means and for issuing a coincidence detection signal in response to a coincidence of the contents of said timer and said retrieved output time data; and

(E) second means connected to said storing means and said comparing means for determining whether to use said storing means as a register which holds said output time data or as a working random access memory in response to said mask data.

4,451,898

ASYNCHRONOUS INTERFACE MESSAGE TRANSMISSION USING SOURCE AND RECEIVE DEVICES

David W. Palermo; David W. Ricci, both of Los Altos, Calif.; Joe E. Marriott, and Thomas J. Heger, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 9, 1981, Ser. No. 319,559
Int. Cl.³ G06F 3/04
U.S. Cl. 364—900 33 Claims

1. A process of transferring message frames of at least a first type and a second type in a linear interface of the type in which at least one receiver is connected to a source in a linear configuration, in which the source has an output port connected to an input port of a first receiver, in which any other receivers each has an input port connected to an output port of a preceeding receiver in the configuration so that message frames pass from the source along the linear interface to a last receiver, said process comprising the steps of:

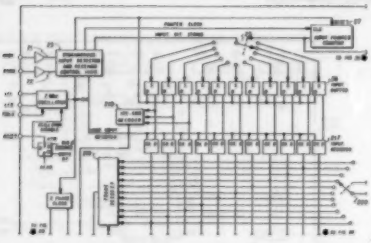
transmitting a message frame from the source to the first receiver;

each receiver other than the last one passing the message

frame on to its succeeding receiver in the linear configuration;

when the first receiver is ready to accept another message frame, transmitting a Ready signal in the direction from the first receiver toward the last receiver;

at each receiver other than the first and last ones, when that receiver is ready to accept another message frame and has also received a Ready signal from the preceding receiver



in the linear configuration, transmitting a Ready signal to its succeeding receiver in the linear configuration; and

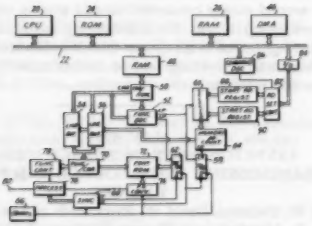
controlling the source to transmit a succeeding message frame only if the last receiver has received a Ready signal and is ready itself to receive another message frame, thereby transmitting said succeeding message frame only when all receivers are ready to accept another message frame.

4,451,899

DISPLAY APPARATUS FOR SIMULTANEOUS DISPLAY OF CHARACTER INFORMATION HAVING DIFFERENT CHARACTER PITCHES

Isao Yamazaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,546
Claims priority, application Japan, Dec. 16, 1980, 55-177736
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **10 Claims**



1. Information processing apparatus comprising:

memory means for storing character information organized in blocks of data, and character pitch information corresponding to said character information associated with each of said blocks;

means for reading said character information and said character pitch information from said memory means;

display means for simultaneously displaying lines of characters corresponding to said character information, with each of said lines having a selected one of a plurality of character pitches and each of said blocks of character information corresponding to a respective one of said lines of characters; and

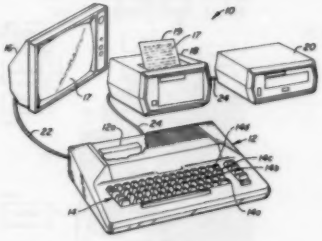
control means for controlling said display means in response to said character information and character pitch information read by said means for reading so that each of said lines of characters displayed on said display means has its selected character pitch determined by the character pitch information associated with said respective block.

4,451,900

METHOD AND APPARATUS FOR TEXT EDITING DISPLAY

Steven T. Mayer, Essex, Conn., and Lawrence D. Emmons, Grass Valley, Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Dec. 29, 1981, Ser. No. 335,471
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—900 **31 Claims**



1. In a word processing system of the type including means for operating a printer for printing text material on a page of recording material in the form of a plurality of characters arranged in a predetermined format and a video display unit for viewing at least selected portions of the text material, a method of providing a view on the video display unit of an overall format of the text as it will appear in printed form, the method comprising the step of:

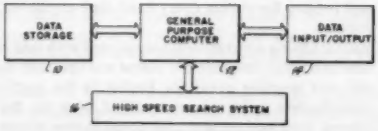
displaying on the video display unit the text material in the form of a graphic representation thereof, the graphic representation including a plurality of display elements each corresponding to one of the characters contained in the text material, the display elements being located within the graphic representation to correspond to the locations of the characters within the format.

4,451,901

HIGH SPEED SEARCH SYSTEM

Donald W. Wolfe, Ormond Beach, and Richard W. Dye, Jr., Port Orange, both of Fla., assignors to General Electric Company, Philadelphia, Pa.

Filed Jan. 21, 1982, Ser. No. 341,530
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **9 Claims**



1. A high speed search system for operation in conjunction with a general purpose computer having a data storage device containing records in the form of digitized information and a data input/output terminal connected to it comprising:

interface means for receiving queries and commands from said data input/output terminal and a portion of the digitized information from said data storage device;

said interface means also transmitting search results to said data input/output terminal;

a query processor;

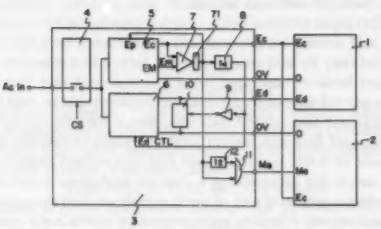
a symbol logic unit;
buffer memory means for containing said portion of the digitized information from said interface means, and applying said portion to said symbol logic unit and said query processor;
each of said records having zones identified therein;
said query processor receiving (a) a query defining data to be located, and (b) all the digitized information from said buffer memory means;
control and timing means for receiving said queries and commands from said interface means;
said symbol logic unit receiving said digitized information from said buffer memory means, recognizing control character sequences and applying corresponding control signals to said query processor; and
said query processor searching only that portion of said digitized information from said buffer memory means as is contained in the zones and records it has been directed to search, and providing search results to said interface means.

4,451,902

POWER SOURCE DEVICE FOR BUBBLE MEMORY UNIT

Ryoji Imazeki; Masayuki Hattori, both of Hachioji, and Shigeo Nakamura, Hino, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Jul. 10, 1981, Ser. No. 282,268
Claims priority, application Japan, Jul. 14, 1980, 55-95975
Int. Cl.³ G11C *19/08*; H02M *3/335*
U.S. Cl. 365—1 **8 Claims**



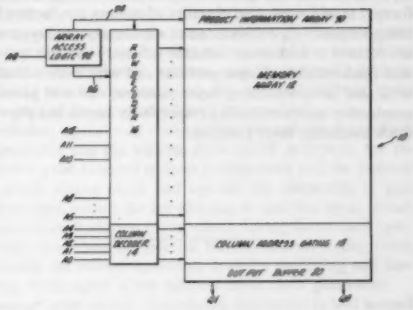
1. In an improved power source device for a bubble memory unit having a bubble memory part and a control part, the power source device being of the type which uses A.C. power and which produces a supply voltage for controlling the bubble memory part and the control part, a supply voltage for driving the bubble memory part, and a memory enable signal to be applied to the control part, the improvement comprising: the supply voltage for controlling the bubble memory part and the control part is produced by a stabilized D.C. power source circuit which employs a switching regulator means for regulating the output of the D.C. power source circuit by using pulse width modulated chopping pulses which have an upper-limit pulse width value during ordinary voltage control when the A.C. power is "on," and which is provided with means for expanding the chopping pulse width in excess of its upperlimit value during ordinary voltage control when the output voltage value of said supply voltage for controlling the bubble memory and control parts has become lower than a predetermined value, so that the pulse width is made greater than in the ordinary voltage control, permitting said bubble memory unit to be reliably refreshed when the A.C. power is turned "off".

4,451,903

METHOD AND DEVICE FOR ENCODING PRODUCT AND PROGRAMMING INFORMATION IN SEMICONDUCTORS

Larry T. Jordan, Pleasanton, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 301,592, Sep. 14, 1981, abandoned. This application Sep. 18, 1981, Ser. No. 303,374
Int. Cl.³ G11C *17/00*
U.S. Cl. 365—94 **9 Claims**



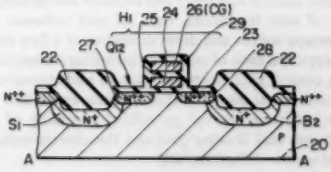
1. A device for providing semiconductor product information to a user through electrical interrogation comprising
a primary circuit disposed upon a semiconductor chip,
a product information array disposed on the semiconductor chip adjacent said primary circuit, said product information array including information sufficient to identify at least the manufacturer of the chip,
access means for receiving first and second signals and for selecting said primary circuit in response to said first signal, said access means including a logic circuit means responsive to said second signal for selecting said product information array while simultaneously preventing access to said primary circuit,
output means for providing output signals representative of the information stored in said product information array.

4,451,904

SEMICONDUCTOR MEMORY DEVICE

June Sugiura, Musashino; Yasunobu Kosa, Kodaira; Kazuhiro Komori, Kodaira; Ken Uchida, Kodaira, and Shinji Shimizu, Houya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,086
Claims priority, application Japan, Feb. 1, 1980, 55-9929
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—182 **6 Claims**



1. In a semiconductor memory formed on a semiconductor substrate with a major planar surface comprising a plurality of MOS type memory cells each having a source, control gate and drain arranged in an array of rows and columns; a plurality of row conductive layers each of which is electrically connected to the control gates of said MOS type memory cells

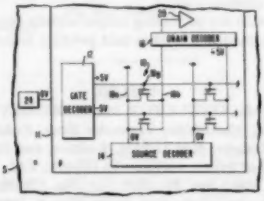
located along a corresponding row; and a plurality of column conductive layers, adjacent column conductive layers being electrically connected to the source and drain respectively of each MOS type memory cell interposed therebetween, the improvement comprising: a thick insulating layer which is formed by selectively oxidizing said major planar surface of said semiconductor substrate so as to leave at least areas of said major surface which are arrayed along said rows, said thick insulating layer having portions which extend along said columns, said areas interposed between adjacent thick insulating layer portions; said plural MOS type memory cells being formed at said areas; said plurality of column conductive layers being respectively constructed of semiconductor layers which are formed in said semiconductor substrate beneath and along said thick insulating layer portions and which are self-aligned with said thick insulating layer portions; and said plural row conductive layers extending respectively across and above said thick insulating layer portions.

4,451,905

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY CELL HAVING A SINGLE TRANSISTOR

Norman E. Moyer, Balboa, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,946
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—185 **18 Claims**



8. A memory comprising:

a plurality of floating gate tunneling semiconductor field effect transistors organized in an array of rows and columns, each of said rows and columns comprising a plurality of said transistors, each of said columns including common source and drain diffusions of a first conductivity-type and each of said rows including a common overlying control gate electrode, each of said transistors having an individual insulated floating gate and a thin region in the insulation thereof permitting tunneling of electrons between said floating gate and the corresponding one of said source diffusions; and

means for reading, including:

means for applying a particular voltage to the overlying control electrode of a selected row and a dufferent voltage to the overlying control electrodes of unselected rows, wherein said different voltage is sufficient to turn off transistors having charged floating gates, and

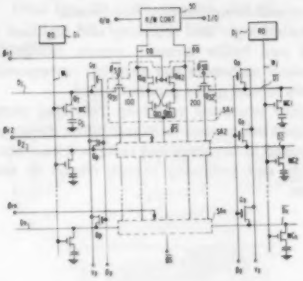
means for sensing the change in source-to-drain current of the drain diffusion of a selected one of said columns.

4,451,906

DYNAMIC TYPE MEMORY DEVICE HAVING IMPROVED OPERATION SPEED

Hiroaki Ikeda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,321
Claims priority, application Japan, Sep. 18, 1980, 55-129497
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—205 **10 Claims**



1. A semiconductor memory device comprising first and second bit lines, a sense amplifier having a first input terminal and a second input terminal, a plurality of memory cells, address means for addressing the memory cells thereby causing a potential difference between said first and second bit lines, a first data line, a second data line, a write circuit coupled to said first and second data lines for operatively supplying said first and second data lines with a pair of true and complementary write signals when a write operation is conducted, a first control gate coupled between said first input terminal and said first bit line, a second control gate coupled between said second input terminal and said second bit line, said first bit line and said first input terminal being coupled only by said first control gate, said second bit line and said second input terminal being coupled only by said second control gate, a first selection gate coupled between said first input terminal and said first data line, a second selection gate coupled between said second input terminal and said second data line, means for selectively conducting said first and second selection gates to thereby apply said pair of write signals to said first and second input terminals, means for determining a state of said sense amplifier in accordance with said pair of write signals applied through said first and second selection gates, means for operatively opening said first and second selection gates from a first time point in said write operation, means for operatively closing said first and second control gates at least from said first point to a second time point when the logic state of said sense amplifier is determined in accordance with said write signal, and means for opening said first and second control gates after said second time point, wherein said write signals are applied to said first and second input terminals when said first and second input terminals are isolated from said first and second bit lines by the closed first and second control gates.

4,451,907

PULL-UP CIRCUIT FOR A MEMORY

William J. Donoghue, Round Rock, and Rodney C. Tesch, Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1981, Ser. No. 314,816
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—203 **9 Claims**

6. A memory circuit comprising:

a column conductor;

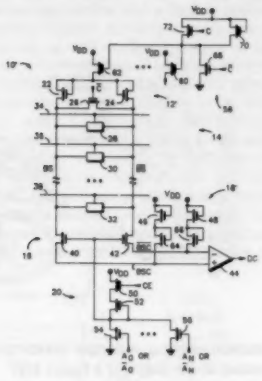
a plurality of memory cells, each memory cell coupled to said column conductor;

a diode-connected transistor coupled between the column conductor and a supply node;

a pull-up transistor coupled between the supply node and a first power supply terminal;

a bit sense common line;

a coupling transistor having a first current electrode coupled to the bit sense common line, a second current electrode coupled to the column conductor, and a control electrode for receiving a decoder signal; and



a column decoder having an output for providing the decoder signal to the control electrode of the coupling transistor in response to a predetermined address and a chip enable signal, wherein said column decoder has a chip enable transistor which is coupled between the output and the first power supply terminal and which is activated in response to the chip enable signal for enabling the column decoder to provide the decoder signal in response to the predetermined address.

4,451,908

ADDRESS BUFFER

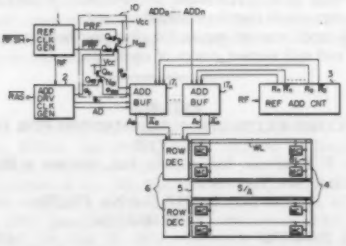
Yoshihiro Takemae, Yokohama; Shigeki Nozaki; Katsuhiko Kabashima, both of Kawasaki; Seiji Enomoto, Yokohama, and Tsutomu Mezawa, Aizuwakamatsu, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 3, 1982, Ser. No. 354,499

Claims priority, application Japan, Mar. 5, 1981, 56-31750

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—222 **7 Claims**



1. An address buffer, for a dynamic memory, having a normal operation mode and a refresh operation mode, the dynamic memory including an address drive clock generator, operatively connected to receive an external address or internal refresh address, for generating a timing clock signal, and a refresh clock generator, operatively connected to the address drive clock generator, for generating an external address timing clock or an internal refresh address timing clock, comprising:

a flip-flop, having a first input/output terminal operatively connected to receive the external address or the internal refresh address and a second input/output terminal operatively connected to receive a reference voltage, said flip-flop latched in either one of two states in dependence upon the external address or the internal refresh address supplied alternately;

an output circuit, operatively connected to said flip-flop, providing an output address and an inverted output address;

a first circuit, operatively connected to said first input/output terminal of said flip-flop and operatively connected to receive the external address and the external address timing clock, for receiving the external address upon receipt of the external address timing clock;

a switcher, operatively connected to the refresh drive clock generator and the address drive clock generator, for receiving the external address timing clock and the internal refresh timing clock and operatively connected to said first input circuit, for transferring to said first input circuit the external address timing clock during the normal operation mode and the internal refresh address timing clock during the refresh operation mode by switching said timing clock signal of the address drive clock generator;

a second input circuit, operatively connected to said second input/output terminal of said flip-flop, for receiving the reference voltage upon receipt of the external address timing clock; and

a third input circuit, operatively connected to receive the internal refresh address clock and the internal refresh address and operatively connected in parallel to said first input circuit, for receiving the internal refresh address upon receipt of the internal refresh address timing clock.

4,451,909

ULTRASONIC WAVE DISTANCE DETECTION SYSTEM

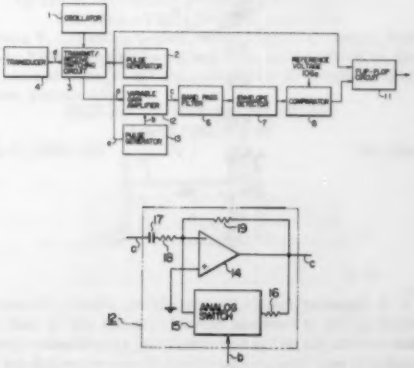
Masao Kodera, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 11, 1981, Ser. No. 329,826

Claims priority, application Japan, Dec. 18, 1980, 55-178038

Int. Cl.³ G01S *15/10, 7/52*

U.S. Cl. 367—99 **4 Claims**



1. An ultrasonic wave distance detection system comprising:

ultrasonic wave transducer means for sending and receiving ultrasonic wave pulses;

oscillator means for generating carrier waves of a carrier frequency available for said ultrasonic wave pulses;

first pulse generator means for generating transmit/receive switching signals;

second pulse generator means for generating gain control signals of a selected pulse width in synchronization with said transmit/receive switching signal;

variable gain amplifier means comprising an operational amplifier having an inverted input terminal and an output terminal, an analog switch coupled to said inverted input terminal and responsive to said gain control signal, a series circuit including a capacitor and an input resistor connected with said inverted input terminal, and a feedback resistor connected between said inverted input terminal and said output terminal of the operational amplifier, said variable gain amplifier means for controlling the gain of signals applied to said amplifier means in accordance with said gain control signal; and

transmit/receive switching circuit means for effecting selective changeover between said transducer means, oscillator means, first pulse generator means and amplifier means in response to the switching signal; and

detecting circuit means for detecting the presence of an obstacle according to the output of said amplifier means;

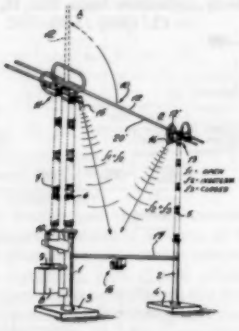
wherein the gain of said variable gain amplifier means is decreased at the beginning of reception of the ultrasonic wave pulses.

4,451,910

ULTRASONIC POSITION MONITOR FOR HV DISCONNECT SWITCH

Julien Simard, Brossard, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Feb. 22, 1982, Ser. No. 351,152
Claims priority, application Canada, Dec. 24, 1981, 393193
Int. Cl.³ G08B *21/00*
U.S. Cl. 367—199 **15 Claims**



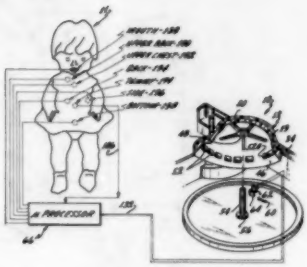
1. A signalling system for use with an electric disconnect switch having at least one movable contact and at least one fixed contact, the said system comprising a transmission system coupled to said fixed contact of said disconnect switch for the transmission of at least one ultrasonic signal indicative of the relative position of the movable contact with relation to the said fixed contact, and a receiver system for receiving said at least one ultrasonic signal transmitted by said transmission system, said receiver generating an output signal representative of the relative position of said movable contact with respect to said fixed contact.

4,451,911

INTERACTIVE COMMUNICATING TOY FIGURE DEVICE

George J. Klose, Lomita; Janice E. Rosenthal, Manhattan Beach; Thomas G. Schneider, Venice, and Robert F. Schroeder, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 3, 1982, Ser. No. 345,285
Int. Cl.³ A63H *3/28, 33/26*; G11B *17/22*
U.S. Cl. 369—31 **9 Claims**



1. An interactive communicating device comprising:

(1) a housing in the shape of a figure toy;

(2) means mounted in said housing for storing a plurality of audible messages;

(3) play means connected to said message storing means for selectively playing individual ones of said plurality of audible messages;

(4) a plurality of switches located on said housing; and

(5) control means including a central processor, having a stored program of coded instructions, coupled to said plurality of switches and said play means, said control means also including:

(a) means for operating said device in a first mode in which each of said switches within said plurality of switches causes said play means to play a particular respective one of said audible messages;

(b) means for operating said device in a second mode in which a plurality of problem-solution pairs exist wherein a selected one of said messages is played announcing a problem and a corresponding one of said switches is exclusively selected to effect the corresponding proper solution upon activation by the user, including means for establishing a respective weighted probability of the occurrence of the announcement of each of said problems, and selection of said selected message is thereby established; and

(c) mode control means for changing between said first and said second modes of operation.

4,451,912

RECORD EXTRACTION MECHANISM FOR DISC PLAYER

Thomas F. Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,378
Int. Cl.³ G11B *25/04*
U.S. Cl. 369—77.2 **12 Claims**

1. A record extraction mechanism for use with a caddy consisting of a record retaining spine removably located inside an outer sleeve; said spine having an opening into which a record is received forming a record/spine assembly; said spine further having a finger for releasably locking said spine to said sleeve; said mechanism comprising:

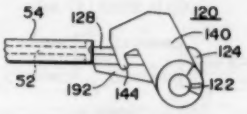
(A) a housing having an input slot through which a caddy is inserted into said housing along a path;

(B) a shaft mounted in said housing away from said input slot at right angles to, and offset from, said caddy insertion path;

(C) a spine releasing member movably mounted on said offset shaft, and having an end thereof disposed in said caddy insertion path when said spine releasing member occupies an initial position; said end of said spine releasing member engaging and deflecting said spine locking finger to release said spine from said sleeve when a caddy is inserted into said housing; said spine releasing member having an actuating portion and a further portion;

(D) a spine latching member movably mounted on said offset shaft, and having an end thereof arranged in said caddy insertion path when said spine latching member is disposed at an initial position; said end of said spine latching member hookingly engaging said spine to secure it in place when a caddy is inserted into said housing, so that said record/spine assembly is retained inside said housing upon the subsequent withdrawal of said sleeve; engagement of said spine latching member with said spine during said caddy insertion deflecting said latching member from said initial position thereof to an intermediate position;

(E) biasing means for yieldably maintaining said end of said spine latching member into engagement with said spine;



said biasing means additionally serving to locate said spine latching member and spine releasing member against a stop, disposed in said housing, in the absence of occupation of said housing by a record/spine assembly; and

(F) means for urging said spine releasing member and said spine latching member together for causing said spine releasing member to follow said deflected spine latching member to an interim position when said sleeve is withdrawn from said housing; said further portion of said spine releasing member, occupying said interim position, being disposed in said caddy insertion path;

an empty sleeve, reinserted into said housing to retrieve said record/spine assembly, contacting and forcing said further portion of said deflected spine releasing member to move away from said spine; said actuating portion of said spine releasing member, in turn, engaging said spine latching member to cause it to rotate in a manner disengaging said spine from said housing during said reinsertion;

wherein said spine latching member has a cutout in which said actuating portion of said spine releasing member is received; said actuating portion engaging a wall defining said cutout when said spine releasing member is rotated away from said interim position to effect said disengagement of said spine in response to said reinsertion.

4,451,913

VIDEO DISC READ BACK SCANNER

James E. Elliott, San Pedro, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 924,538, Jul. 14, 1978, Pat. No. 4,282,598, which is a continuation-in-part of Ser. No. 812,180, Jul. 1, 1977, abandoned, which is a continuation of Ser. No. 662,238, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 465,823, May 1, 1979, Pat. No. 3,944,727, Ser. No. 299,893, Oct. 24, 1972, Pat. No. 3,829,622.

This application Aug. 3, 1981, Ser. No. 290,261

Int. Cl.³ G11B 7/00

U.S. Cl. 369—110 **3 Claims**

1. Apparatus arranged to read indicia in an information track on a reflective surface of a disc, comprising:

a laser source means for producing a polarized, collimated reading beam of light radiation having its direction of polarization aligned along a predetermined angular orientation with respect to the optical axis;

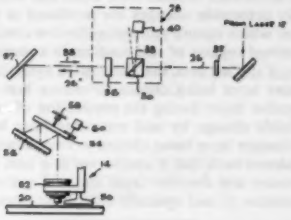
beam directing means for directing such reading beam from said source means along a reading beam path, and for impinging said beam upon said information track;

optical means for causing said reading beam reflected by said information track to retrace at least a portion of said reading beam path;

sensing means for receiving said reflected beam from said information track;

said beam directing means including:

a beam splitting prism having its angular orientation aligned with the orientation of light in said reading beam for



passing all of said reading beam from said source to said information track;

a quarter wave plate positioned between said beam splitting prism and said information track for shifting the plane of polarization of the reading beam and the reflected beam a total of 90° after the two passages through the quarter wave plate; and

said beam splitting prism being aligned with the direction of polarization of said reflected beam for directing substantially all of said reflected beam out of the common path and towards said sensing means, whereby any of said reflected beam reaching said laser source means being cross polarized with respect to said polarized, collimated reading beam.

4,451,914

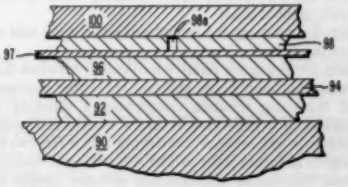
OPTICAL STORAGE SYSTEM EMPLOYING A MULTI-LAYER OPTICAL MEDIUM

Edward V. LaBudde, Newbury Park; Miguel A. Capote, Westlake Village; Shiuh Chao, Hawthorne, and Neville K. S. Lee, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 15, 1982, Ser. No. 368,668

Int. Cl.³ G11B 7/00

U.S. Cl. 369—109 **20 Claims**



18. In an optical storage system, the combination comprising:

an optical recording medium;

means for providing a recording laser beam having a predetermined wavelength;

means for modulating said recording beam in accordance with applied data;

means for focusing the modulated beam upon said recording medium; and

means providing for relative movement between the focused recording laser beam and said recording medium;

said recording medium comprising a plurality of layers including a reflective layer, a fluorinated hydrocarbon polymer spacer layer overlaying said reflective layer, a nucleation layer overlaying said fluorinated hydrocarbon polymer spacer layer, and a tellurium absorber layer overlaying said nucleation layer, the thicknesses and optical characteristics of said layers being chosen so that unrecorded regions of said medium exhibit an anti-reflection condition at said predetermined wavelength, said medium being adapted so that during relative movement between the modulated focused laser beam and said medium optically detectable changes are produced in said absorbing layer which disturb said anti-reflective condition at predetermined regions of said medium in a manner representative of applied data, said fluorinated hydrocarbon polymer spacer layer being chosen to reduce heat loss from the absorber layer during the production of an optically detectable change by said recording laser beam, and said nucleation layer being chosen to have a melting point and thickness such that it also serves as a heat insulator layer between said absorber layer and said spacer layer during formation of said optically detectable change.

4,451,915

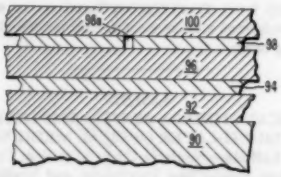
OPTICAL STORAGE SYSTEM EMPLOYING A MULTI-LAYER OPTICAL MEDIUM

Edward V. LaBudde, Newbury Park; Miguel A. Capote, Westlake Village; Shiah Chao, Hawthorne, and Neville K. S. Lee, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 15, 1982, Ser. No. 368,667

Int. Cl.³ G11B 7/24

U.S. Cl. 369—109 **12 Claims**



5. In an optical storage system, the combination comprising:

an optical recording medium;

means for providing a recording laser beam having a predetermined wavelength;

means for modulating said recording beam in accordance with applied data;

means for focusing the modulated beam upon said recording medium; and

means providing for relative movement between the focused recording laser beam and said recording medium;

said recording medium comprising a plurality of layers including a reflective layer, a fluorinated hydrocarbon polymer spacer layer overlaying said reflective layer, and a gold absorber layer of 150 Angstroms or less overlaying said fluorinated hydrocarbon polymer spacer layer, the thicknesses and optical characteristics of said layers being chosen so that unrecorded regions of said medium exhibit an anti-reflection condition at said predetermined wavelength, said medium being adapted so that during relative movement between the modulated focused laser beam and said medium optically detectable changes are produced in said absorbing layer which disturb said anti-reflective condition at predetermined regions of said medium in a manner representative of applied data, said fluorinated hydrocarbon polymer spacer layer acting to reduce heat loss from the absorber layer during the production of an optically detectable change by said recording laser beam.

4,451,916

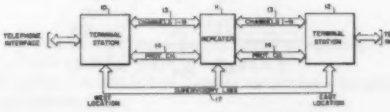
REPEATERED, MULTI-CHANNEL FIBER OPTIC COMMUNICATION NETWORK HAVING FAULT ISOLATION SYSTEM

Paul W. Casper, Melbourne; Norman C. Seiler, West Melbourne, both of Fla.; Thomas J. Nixon, Gaithersburg, Md.; George A. Waschka, Jr., Melbourne, Fla.; Charles R. Patisaul, Melbourne, Fla.; James W. Toy, Melbourne, Fla.; Willie T. Burton, Jr., Palm Bay, Fla.; W. B. Ashley, Manhattan Beach, Calif.; Fred J. Orlando, Jr., West Melbourne, Fla.; Ronald R. Giri, Melbourne, Fla.; Peter H. Halpern, Longwood, Fla.; J. Richard Jones, Melbourne, Fla., and Harold Iley, Huntsville, Ala., assignors to Harris Corporation, Melbourne, Fla.

Filed May 12, 1980, Ser. No. 149,291

Int. Cl.³ H04J 3/12

U.S. Cl. 370—16 **104 Claims**



1. In a communication network wherein signals are conveyed between first and second stations over a first communication link having at least one repeater station disposed between said first and second stations, a method for isolating a fault occurring on said link comprising the steps of:

(a) transmitting a first prescribed encoded signal sequence over said communication link;

(b) selectively monitoring, at respective stations along said link, a prescribed signal transmission characteristic of the respectively monitored stations along said link; and

(c) in response to a prescribed change in the signal transmission characteristic of said link at one of said monitored stations, representative of the existence of a fault in said link at said one of said monitored stations, transmitting from said one of said monitored stations a signal representative of said change in signal transmission characteristic, so as to identify said fault as being associated with that monitored station along said link that introduces said prescribed change in said signal transmission characteristic.

4,451,917

METHOD AND APPARATUS FOR PULSE TRAIN SYNCHRONIZATION IN PCM TRANSCEIVERS

Calvin H. DeCoursey, Reno, Nev., assignor to Lynch Communication Systems, Inc., Reno, Nebr.

Filed Jan. 15, 1981, Ser. No. 225,194

Int. Cl.³ H04J 3/06

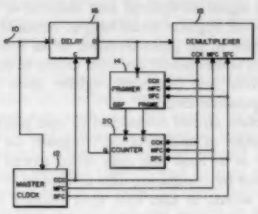
U.S. Cl. 370—108 **7 Claims**

5. A method of synchronizing a received PCM pulse train with fixed clocks running at the bit rate and frame rate of said received pulse train, respectively, for demultiplexing said pulse train in synchronism with said frame rate clock, comprising the steps of:

(a) variably delaying said pulse train;

(b) counting the number of bit-rate clock pulse intervals occurring between a frame pulse of said delayed pulse train and a pulse of said frame-rate clock;

(c) adjusting said variable delay to correspond to the sum of the bit rate clock pulse intervals so counted; and



(d) demultiplexing said delayed pulse train in accordance with said frame-rate clock.

4,451,918

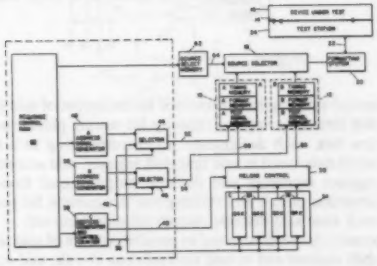
TEST SIGNAL RELOADER

Garry C. Gillette, Westlake Village, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Oct. 9, 1981, Ser. No. 309,982

Int. Cl.³ G01R *31/28*

U.S. Cl. 371—27 **8 Claims**



1. Apparatus for providing a continuous sequence of test data for testing LSI devices, each of said devices having a multiplicity of pins, comprising

a plurality of memory elements associated with each of said pins, for storing said test data,

a random access storage element having higher capacity and lower speed than each of said memory elements, for storing said test data,

test sequence control circuitry for routing said test data selectably from any one of said memory elements to its associated said pin, and

reloading circuitry for causing a portion of said test data stored in said storage element to be selectably addressed and loaded into any one of said memory elements which is not providing said test data to said pins.

4,451,919

DIGITAL SIGNAL PROCESSOR FOR USE IN RECORDING AND/OR REPRODUCING EQUIPMENT

Ryoichi Wada, Habikino; Mitsuharu Tsuchiya; Takanori Senoo, both of Katano, and Kanji Odagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 97,549, Nov. 26, 1979, abandoned. This application Mar. 5, 1982, Ser. No. 355,207

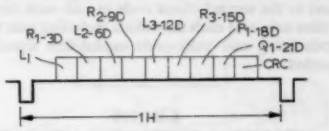
Claims priority, application Japan, Nov. 28, 1978, 53-147456

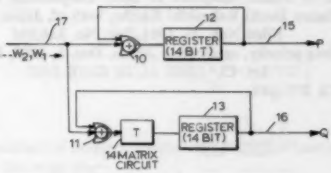
Int. Cl.³ G06F *11/10*

U.S. Cl. 371—38 **2 Claims**

1. A digital signal processor for use in recording equipment which converts an analog signal into a pulse-code modulation signal and records said pulse-code modulation signal, said processor comprising:

a data input terminal to which are inputted a plurality of data words, composing a series of data sets, each data set being composed of K data words (K denotes an integer), each data word being composed of G data bits (G denotes an integer);





a first check code generating means coupled to said data input terminal for generating in each data set a G bit first check code by combining corresponding bits of all positions of respective data words in each data set via a modulo 2 summation expressed as:

$$\sum_{i=1}^{K} W_i = (w_{11} \oplus w_{21} \oplus \ldots \oplus w_{K1},\ w_{12} \oplus w_{22} \oplus \ldots \oplus w_{K2},$$

$$\ldots,\ w_{1G} \oplus w_{2G} \oplus \ldots \oplus w_{KG})$$

where W_i is said data word and $W_i = (w_{i1}, W_{i2}, \ldots, w_{iG})$, w_{ij} $(j = 1, 2, \ldots, G)$ is a bit of 0 or 1, and

$$\sum_{i=1}^{K}$$

means the modulo 2 summation of K data words;

a second check code generating means coupled to said data input terminal for generating in each data set a G bit second check code which is the modulo 2 sum of the current word and the previous result being multiplied by matrix T to generate the current sum, said second check code being expressed as:

$$\sum_{i=1}^{k} T^{k-i+1} W_i$$

where, T is an associated matrix of a G-th order polynomial;

a memory means coupled to both said first check code generating means and said second check code generating means for (a) temporarily storing said series of data sets, corresponding first check codes and corresponding second check codes, and (b) constructing data blocks each composed of K data words, one first check code and one second check code, the first data word of said data block being the first data word of the first set of the stored data sets, the second word of said data block being the second data word of the second data set of the stored data sets, . . . , the Kth data word of said data block being the Kth data word of the Kth data set of the stored data sets, said

one first check code being the first check code generated from the (K+1)th data set of the stored data sets, and said one second check code being the second check code generated from the (K+2)th data set of the stored data sets; and

a third check code generating means coupled to said memory means for generating from each of said data blocks a third check code which is a redundant word for error detection, said third check code being located at a position next to the second check code in said each data block on a time axis, said each data block including said third check code being said pulse-code modulation signal to be recorded.

4,451,920

PCM SIGNAL PROCESSING APPARATUS

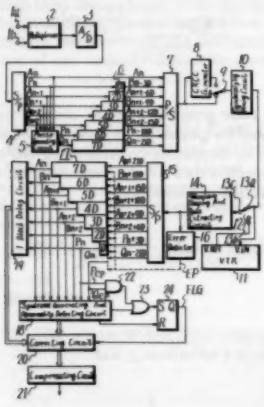
Susumu Hoshimi, Yokohama, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Sony Corporation and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Nov. 25, 1981, Ser. No. 324,816

Claims priority, application Japan, Dec. 1, 1980, 55-169410

Int. Cl.³ G06F *11/10*; G11B *5/00*

U.S. Cl. 371—40 **5 Claims**



1. Means for correcting a PCM signal comprising time interleaved binary data words and error correction and error detection words comprising, an error detecting circuit receiving the incoming PCM signal, a time de-interleaver means receiving the incoming PCM signal and separating it to a plurality of parallel binary data and error correction and error detection words, a syndrome and abnormal detecting circuit receiving the output of said time de-interleaver means, a data correcting circuit receiving inputs from said de-interleaver and said syndrome and abnormal detecting circuit, and including a flip-flop for producing a flag which is supplied to said data correcting circuit and receiving an input from said syndrome and abnormal detecting circuit.

4,451,921

PCM SIGNAL PROCESSING CIRCUIT

Kentaro Odaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 4, 1981, Ser. No. 289,970

Claims priority, application Japan, Aug. 6, 1980, 55-107937

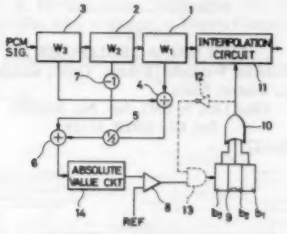
Int. Cl.³ G06F *11/00, 11/26*

U.S. Cl. 371—48 **6 Claims**

1. A pulse code modulation signal processing circuit for detecting errors in pulse code modulated signal words, the detected errors being used to control an associated interpolation circuit for correcting these errors comprising:

a first shift register capable of storing plural data words having a series input terminal, a series output terminal, and plural parallel output terminals, said first shift register receiving at its series input terminal a pulse code modulated signal structured into successive data words, said first shift register series output terminal being connected in series to an input terminal of an interpolation circuit, which subsequently corrects errors in data words outputted from said first shift register upon operation of said interpolation circuit;

a detection circuit connected to said plural parallel output terminals of said first shift register for detecting a data error in at least one data word stored in said first shift register by comparing data contained in said stored plural data words in said first shift register by using a linear prediction method, said detection circuit further outputting a discrete signal indicating whether or not an error is present in said one data word in said first shift register;



a second shift register connected to the output of said detection circuit having the capacity for storing plural designation bits, each designation bit corresponding to a designated data word in said first shift register, said second shift register receiving said discrete output signal from said detection circuit and shifting one designation bit position each time said discrete output signal is received;

a control circuit connected to parallel outputs of said second shift register and to said interpolation circuit, said control circuit turning on said interpolation circuit whenever any one of said plural designation bits stored in said second shift register indicates data word error, and turning off said interpolation circuit whenever none of the plural designation bits stored in said second shift register indicates data word error.

4,451,922

TRANSMISSION LOGIC PARITY CIRCUIT

Ziba T. Dearden, Manassas, and Yogi K. Puri, Vienna, both of Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,706

Int. Cl.³ G06F *11/10*; H04L *1/10*

U.S. Cl. 371—49 **3 Claims**

1. A parity circuit for determining whether an odd or even number of binary bits having an even number of binary bits having a value of one, are present, at an n-bit plurality of binary operand bit inputs, comprising:

n-stages of sequentially connected steering cells, each said cell including a true-value binary bit operand input and a complementary-value binary bit operand input for one said plurality of operand bit inputs, a first and a second indicating potential input terminals and a first and a second indicating potential output terminals;

said first indicating potential input terminal of an i-th cell connected to said first indicating potential output terminal of the next preceding i+1th cell and said second indicating potential input terminal of said i-th cell connected to said second indicating potential output terminal of said next preceding i+1th cell;

a first FET device in each said cell having its drain con-

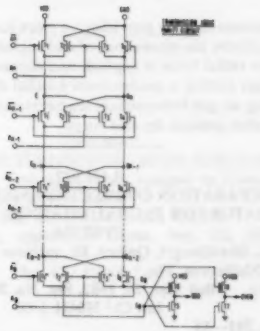
nected to said first indicating potential input terminal thereof, its source connected to said first indicating potential output terminal thereof, and its gate connected to said complementary-value binary bit operand input thereof;

a second FET device in each said cell having its drain connected to said second indicating potential input terminal thereof, its source connected to said first indicating potential output terminal thereof, and its gate connected to said true-value binary bit operand input thereof;

a third FET device in each said cell having its drain connected to said first indicating potential input terminal thereof, its source connected to said second indicating potential output terminal thereof, and its gate connected to said true-value binary bit operand input thereof;

a fourth FET device in each said cell having its drain connected to said second indicating potential input terminal thereof, its source connected to said second indicating potential output terminal thereof, and its gate connected to said complementary-value binary bit operand input thereof;

said first FET device in each of said cells forming a conductive path between said first indicating potential input terminal and said first indicating potential output terminal and said fourth FET device in the same cell forming a conductive path between said second indicating potential input terminal and said second indicating potential output terminal when said complementary-value binary bit operand input in the same cell is active;



said third FET device in each of said cells forming a conductive path between said first indicating potential input terminal and said second indicating potential output terminal and said second FET device in the same cell forming a conductive path between said second indicating potential input terminal and said first indicating potential output terminal when said true-value binary bit operand input in the same cell is active;

said first indicating potential input terminal in a first one of said cells in said sequence having a first DC potential continuously applied to it corresponding to a binary one bit value and said second indicating potential input terminal in said first one of said cells having a second DC potential continuously applied to it corresponding to a binary zero bit value said first DC potential being different from said second DC potential;

said second indicating potential output terminal in a last one of said cells in said sequence outputting a signal corresponding to said first DC potential in response to an odd number of said cells having their respective true-value binary bit operand input active indicating an odd parity and said second indicating potential output terminal in said last cell outputting a signal corresponding to said second DC potential in response to an even number of said cells having their respective true-value binary bit operand input active indicating an even parity.

4,451,923

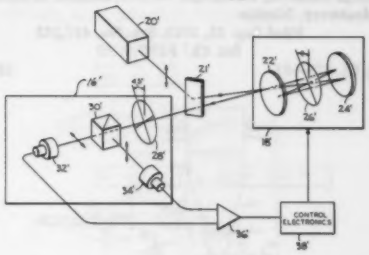
METHOD OF AND APPARATUS FOR MEASURING OPTICAL FREQUENCY VARIATIONS

Theodor W. Hansch, 15100 Oak Creek Dr., (Apt. 405), Palo Alto, Calif. 94304, and Bernard J. Couillaud, 26 rue Ernest Renaut, Talence, France

Filed Dec. 1, 1980, Ser. No. 211,910

Int. Cl.³ H01S 3/13

U.S. Cl. 372—32 **5 Claims**



1. The method of frequency stabilizing a tunable laser which comprises the steps of

positioning a resonant passive optical cavity to receive a laser beam so that a perpendicular component is directly reflected but a parallel component enters the cavity for indirect reflection therefrom,

disposing an intracavity anisotropic optical element in said cavity at an angle relative to a polarization axis of the incident laser beam to produce a phase shift of an indirectly reflected parallel component relative to a directly reflected perpendicular component, thus to provide a frequency-dependent phase shift between said two reflected components, resulting in an elliptical polarization correlated with any frequency deviation from cavity resonance,

detecting the amount of ellipticity to provide an error signal, and

adjusting the laser frequency an amount determined by the amplitude of such error signal.

4,451,924

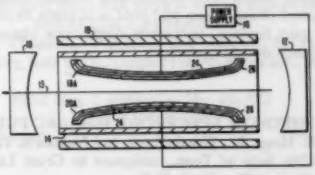
MERCURY HALIDE LASERS UTILIZING ELECTRODES COATED WITH A GETTER

Chi-Sheng Liu, Monroeville, and Chikara Hirayama, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1982, Ser. No. 379,811

Int. Cl.³ H01S 3/22

U.S. Cl. 372—59 **7 Claims**



1. A laser comprising:

(a) an enclosure for containing a gaseous compound lasing medium in a laser cavity, said gaseous compound having a tendency to disassociate into its individual components during normal operation;

(b) electrode means for exciting said lasing medium; and

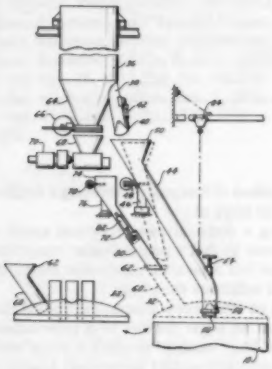
(c) means for reducing the chemical reaction between said electrode means and selected ones of said individual components of said lasing medium which become disassociated during normal operations of said laser, comprising a mercury amalgam layer affixed to at least a portion of the surface of said electrode means.

4,451,925

CHARGING SYSTEM FOR ELECTRIC ARC FURNACES

E. Jorge Sandoval, Guadalupe, Mexico, assignor to Hylsa, S.A., Monterrey, Mexico

Filed Sep. 13, 1982, Ser. No. 417,213
Int. Cl.³ F27D *3/10*
U.S. Cl. 373—81 **18 Claims**



1. Apparatus for charging an electric arc furnace with a relatively free-flowing charge of iron-containing particles with improved distribution of the charge of particles within the furnace, the electric arc furnace having a roof laterally movable to selectively open and cover the top of the furnace, comprising

hopper means containing a supply of said iron-containing particles disposed at a location elevated with respect to said furnace;

a first chute movable with respect to said furnace when said roof is moved to open the furnace and having an upper end to receive said particles from said hopper and a lower end to feed said particles into said furnace;

distributor means disposed at the lower end of said first chute to distribute said particles exiting said first chute in a predetermined pattern within said furnace;

a second chute affixed to the furnace roof having an upper end to receive said iron-containing particles and a lower end communicating through said roof with the interior of said furnace; and

coupling means for coupling said hopper means with said second chute, when said roof is in place to cover the top of said furnace, to permit continuous charging of said furnace during operation.

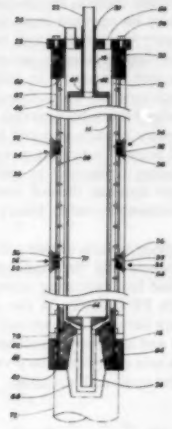
4,451,926

COMPOSITE ELECTRODE FOR ARC FURNACE

Grady R. Hogg, Jr., Elizabethton, and Nathan S. Tanner, Johnson City, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,827
Int. Cl.³ H05B *7/08*
U.S. Cl. 373—93 **5 Claims**

1. In a composite liquid-cooled arc furnace electrode comprising a metal cylindrical upper section, a metal connecting nipple, and a graphite lower section, the improvement comprising arcuate graphite segments protecting the exterior of said upper section, the top and bottom of said segments being beveled and held in place by circular metal rings having a complementary bevel angle to said segments and attached to said upper section in a relationship such that when a force is applied radially inward to said segments a mechanical and electrical bond is established between said segments and said



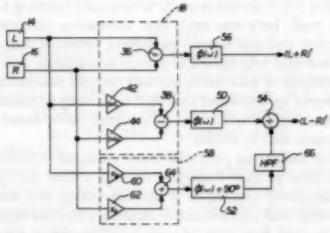
upper section thereby providing an electrical current path into said electrode, the dimensions of said segments being such that when no radial force is applied, said segments fall away from said upper section a predetermined radial distance, leaving an insulating air gap between said segments and said upper section held in that position by said rings.

4,451,927

SEPARATION CORRECTION METHOD AND APPARATUS FOR PLURAL CHANNEL TRANSMISSION SYSTEM

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 24, 1982, Ser. No. 361,572
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—15 **33 Claims**



1. Apparatus comprising

means for providing first and second signals to be communicated over different channels of a plural channel communication system,

means responsive to said second signal for providing two modified second signals therefrom, said signals being phase shifted relative to one another by a fixed amount,

means for selectively adjusting the relative gains of said two modified second signals,

means for combining said two modified second signals so as to provide a combined signal to be communicated over a

channel of said plural channel communication system in place of said second signal.

29. In a stereo AM radio broadcasting system including left (L) and right (R) audio signal sources which provide audio signals to be modulated onto an RF carrier signal for transmission to a remote radio receiver, a matrix circuit to which said left and right audio signal sources are connected for adding and subtracting said signals to provide sum (L+R) and difference (L−R) signals, dynamic gain varying means responsive to the difference signal for dynamically varying its gain to provide a varying gain difference signal, and a quadrature AM transmitter for modulating the sum and varying-gain difference signals onto the in-phase and quadrature-phase carrier components, respectively, of a quadrature AM signal, the improvement comprising processing means responsive to said sum and varying gain difference signals for deriving a modified varying gain difference signal therefrom for application to the quadrature AM transmitter in place of said varying gain difference signal, said modified signal corresponding generally to said varying gain difference signal but also including a first selective gain component corresponding to the sum of said sum signal and said varying gain difference signal and a second selective gain component corresponding to the difference between said sum signal and said varying gain difference signal.

4,451,928

MULTI-SPEAKER SYSTEM FOR USE IN AUTOMOBILES

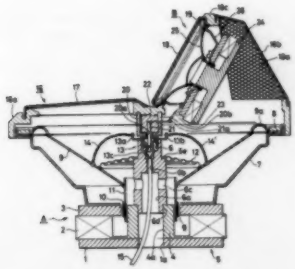
Fumio Murayama, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,190

Claims priority, application Japan, Sep. 22, 1981, 56-139798[U]

Int. Cl.³ H04R 1/02

U.S. Cl. 381—86 **12 Claims**



1. A multi-speaker system, comprising; a low-frequency loudspeaker, midrange and/or high-frequency loudspeakers mounted on the low-frequency loudspeaker, the low-frequency loudspeaker having a magnetic circuit including a center pole having a through hole extending in a direction in which sound is radiated from the low-frequency loudspeaker, and an external input lead wire extending through said through hole toward a distal end of said center pole and divided at said distal end into branches toward said low-frequency loudspeaker and said midrange and/or high-frequency loudspeakers.

4,451,929

PATTERN DISCRIMINATION METHOD

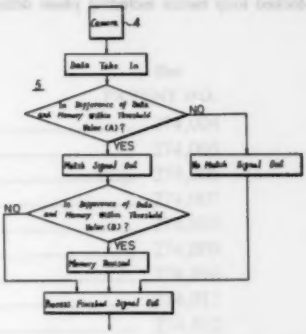
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Japan

Continuation-in-part of Ser. No. 109,969, Jan. 7, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,809

Claims priority, application Japan, Nov. 10, 1978, 53-138578

Int. Cl.³ G06K 9/66

U.S. Cl. 382—15 **2 Claims**



1. A method of pattern discrimination in a pattern inspection apparatus of the type having a light source for illuminating an object to be inspected, a video camera effective to produce an electrical signal corresponding to said object, and a pattern discrimination system for comparing data from said electrical signal with standard data memorized from a standard subject of a type to be recognized to determine whether said object is of the same type as said standard subject comprising the steps of:

setting a first threshold A for determining whether or not said data from said electrical signal contains characteristics sufficiently close to said standard data to judge said object to be of the same type as said standard subject;

setting a second threshold B smaller than said first threshold A for determining whether or not said data from said electrical signal contains characteristics sufficiently close to said standard data to judge said object to be substantially identical to said standard subject;

determining a difference between said characteristics of said data and said standard data;

producing a match signal if said difference is less than said first threshold A; and

replacing said standard data with said data if said difference is less than said second threshold B.

4,451,930

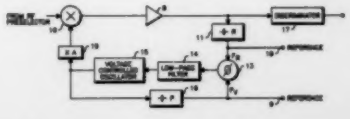
PHASE-LOCKED RECEIVER WITH DERIVED REFERENCE FREQUENCY

Ronald H. Chapman, Wheaton, and Andrew F. Peterson, Schaumburg, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 2, 1982, Ser. No. 403,972

Int. Cl.³ H04B 1/26

U.S. Cl. 455—260 **14 Claims**



1. An improved phase-locked receiver for deriving a refer-

ence signal from a received RF carrier signal, including in combination:

means for converting the received RF carrier signal into a desired IF frequency;

means coupled to said converting means for amplifying said IF frequency;

frequency multiplying means coupled to said frequency converting means;

first frequency divider means coupled to said amplifying means;

phase-locked loop means including phase detector means, low pass filter means and voltage controlled oscillator means and coupled between said frequency multiplying means and said first divider means;

said first divider means providing a first input to said phase detector means; and

second frequency divider means coupled between said frequency multiplying means and a second input of said phase detector means, whereby, a derived reference signal is provided at a terminal of said phase-locked receiver.

DESIGN PATENTS

GRANTED MAY 29, 1984

ERRATA

For CLASS	See PATENT NO.
D25–055	274,004
D25–087	274,005
D25–038	274,006
D26–093	274,007
D28–007	274,008
D28–039	274,009
D28–047	274,010
D32–001	274,011
D34–040	274,012
D34–014	274,013
D34–021	274,014
D26–138	274,068

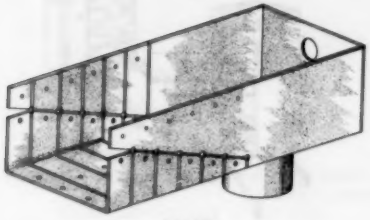
DESIGN PATENTS

GRANTED MAY 29, 1984

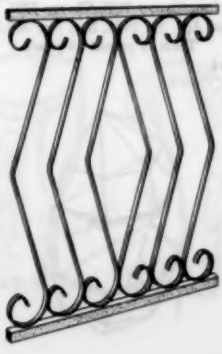
CLASS

Class	Patent No.
D25-00	274,000
D25-01	274,001
D25-02	274,002
D25-03	274,003
D25-04	274,004
D25-05	274,005
D25-06	274,006
D25-07	274,007
D25-08	274,008
D25-09	274,009
D25-10	274,010
D25-11	274,011
D25-12	274,012
D25-13	274,013
D25-14	274,014
D25-15	274,015

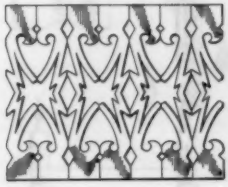
274,004
DRAIN BOX
Joseph N. Argentina, 235 Meyner Dr., Bellmawr, N.J. 08031
Filed Jun. 28, 1982, Ser. No. 393,190
Term of patent 14 years
U.S. Cl. D25—55



274,005
GRILL
Harvey Porter, Narberth, and Rubina M. Long, Philadelphia, both of Pa., assignors to Royal Factories, Inc., Philadelphia, Pa.
Filed Jun. 10, 1982, Ser. No. 386,903
Term of patent 14 years
U.S. Cl. D25—87



274,006
FENCING
John Djurina, 3300 W. Layton Ave., Milwaukee, Wis. 53221
Filed Jan. 8, 1982, Ser. No. 338,578
Term of patent 14 years
U.S. Cl. D25—38



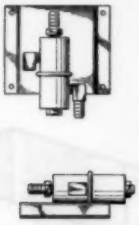
274,007
LAMP
Eli Lengacher, Rte. 3, Box 559, Grabill, Ind. 46741
Filed Jan. 22, 1982, Ser. No. 341,593
Term of patent 14 years
U.S. Cl. D26—93

274,008
ADJUSTABLE COSMETIC APPLICATOR
Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236, and Henry J. Cassai, 95-15 107 St., Ozone Park, N.Y. 11416
Filed Jul. 6, 1982, Ser. No. 395,494
Term of patent 14 years
U.S. Cl. D28—7

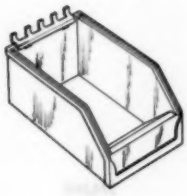
274,009
HAIR CLIP
Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117
Filed Feb. 12, 1982, Ser. No. 348,546
Term of patent 14 years
U.S. Cl. D28—39

274,010
SLEEVE FOR A DISPOSABLE SAFETY RAZOR
Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.
Filed Sep. 30, 1981, Ser. No. 307,192
Term of patent 14 years
U.S. Cl. D28—47

274,011
FOAM GENERATOR FOR A CLEANING MACHINE
Thomas G. Lafferty, 916 Oak Grove Rd., North Little Rock, Ark. 72118
Filed Dec. 10, 1980, Ser. No. 215,124
Term of patent 14 years
U.S. Cl. D32—01



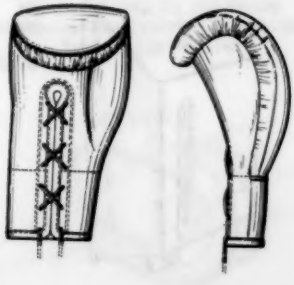
274,012
BIN FOR MERCHANDISE
Robert F. Williams, 9505 E. Atherton Rd., Davison, Mich. 48423
Filed Dec. 4, 1981, Ser. No. 327,403
Term of patent 14 years
U.S. Cl. D34—40



274,013
BIRD FEEDER
George C. Sun, One Cherry Hill, Cherry Hill, N.J. 08002
Filed Apr. 16, 1982, Ser. No. 369,202
Term of patent 14 years
U.S. Cl. D30—14

274,014
MOBILE STORAGE UNIT
Kenneth Reiner, Long Beach, Calif., assignor to Kayline Enterprises, Inc., Long Beach, Calif.
Filed Aug. 13, 1981, Ser. No. 292,600
Term of patent 14 years
U.S. Cl. D34—21

274,015
BOXING GLOVE
John C. Golomb, Brooklyn, N.Y., assignor to Everlast World's Boxing Headquarters Corp., Bronx, N.Y.
Filed Aug. 7, 1981, Ser. No. 291,187
Term of patent 14 years
U.S. Cl. D2—361



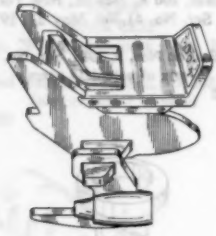
274,016
SLIDE FASTENER CHAIN
Kazumi Kasai, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 2, 1981, Ser. No. 250,277
Claims priority, application Japan, Aug. 11, 1980, 55-32776
Term of patent 14 years
U.S. Cl. D2—415

274,017
CUFF LINK
Philip L. Engelhardt, 200 E. 74th St., New York, N.Y. 10021
Division of Des. Ser. No. 41,200, May 21, 1979, Pat. No. D. 263,765.
This application Nov. 9, 1981, Ser. No. 319,656
Term of patent 14 years
U.S. Cl. D2—422

274,018
TOOTHBRUSH
Soichiro Usui, One Hook Rd., Rye, N.Y. 10580
Filed Dec. 21, 1981, Ser. No. 332,811
Term of patent 14 years
U.S. Cl. D4—25

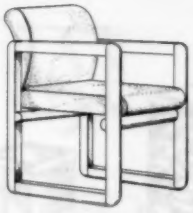
274,019
COMBINED CHAIR BACK COVER AND PERSONAL ARTICLE HOLDER
Ronald Stead, and Eunice L. Stead, both of 4244 E. Francis Rd., Mt. Morris, Mich. 48458
Filed Nov. 4, 1981, Ser. No. 318,029
Term of patent 14 years
U.S. Cl. D6—4

274,020
COMBINED SEAT AND DETACHABLE TRAY FOR A CHILD
Bruce E. Byers, 2405 Dunwoody Ave., Wayzata, Minn. 55391
Filed Oct. 13, 1981, Ser. No. 310,647
Term of patent 14 years
U.S. Cl. D6—12

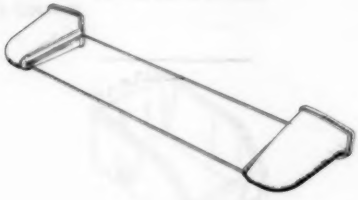


274,021
ARM CHAIR
Donald C. Petitt, 207 W. 86th St., New York, N.Y. 10024
Filed Nov. 9, 1981, Ser. No. 319,547
Term of patent 14 years
U.S. Cl. D6—31

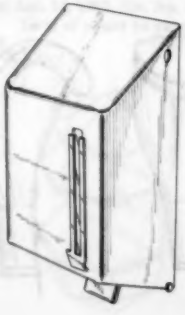
274,022
CHAIR
John W. Caldwell, San Marino, Calif., assignor to Pacific Furniture Manufacturing Company, Compton, Calif.
Filed Jul. 6, 1981, Ser. No. 280,655
Term of patent 14 years
U.S. Cl. D6—69



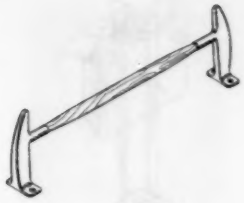
274,023
BATHROOM SHELF
Jersy Boroch, Saint Ismier, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,820
Claims priority, application Hague, Oct. 15, 1981, DM 000/978
Term of patent 14 years
U.S. Cl. D6—86



274,024
LIQUID SOAP DISPENSER
André Vignot, Coubron, France, assignor to Laboratoires Prodene-Klint, Vaujours, France
Filed Aug. 25, 1981, Ser. No. 296,224
Claims priority, application France, Mar. 20, 1981, 811036
Term of patent 14 years
U.S. Cl. D6—95



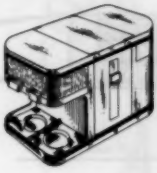
274,025
TOWEL-TIE BAR
J. Edward Dobbs, III, Selma, Ala., assignor to Golden Eagle Enterprises Inc., Selma, Ala.
Filed Feb. 11, 1982, Ser. No. 348,077
Term of patent 14 years
U.S. Cl. D6—99



274,026
WALL-MOUNTED TOWEL RACK
Jersy Boroch, Saint Ismier, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,821
Claims priority, application Hague, Oct. 15, 1981, DM 000/978
Term of patent 14 years
U.S. Cl. D6—99

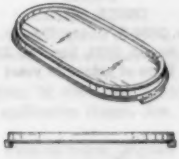
274,027
TOWEL HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, Australia
Filed Dec. 3, 1982, Ser. No. 446,646
Claims priority, application Australia, Oct. 12, 1982, 1816/82
Term of patent 14 years
U.S. Cl. D6—99

274,028
BEVERAGE DISPENSER
Robins E. Jeans, Ledbury, England, assignor to Cadbury Schweppes PLC, London, England
Filed Nov. 2, 1981, Ser. No. 317,290
Term of patent 14 years
U.S. Cl. D7—308



274,029
COFFEE MAKING MACHINE
Donald L. Daugherty, Sherman, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Nov. 4, 1981, Ser. No. 318,131
Term of patent 14 years
U.S. Cl. D7—309

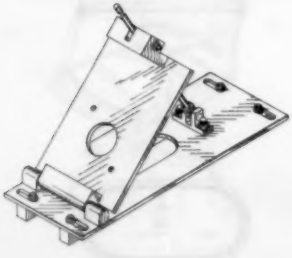
274,030
COVER FOR A FOOD STORAGE CONTAINER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 9, 1982, Ser. No. 356,603
Term of patent 14 years
U.S. Cl. D7—391



274,031
LIQUOR DISPENSING HEAD
Heiko T. de Man, Gualala, Calif., assignor to Gamble, Inc., Portland, Oreg.
Filed Mar. 8, 1982, Ser. No. 356,070
Term of patent 14 years
U.S. Cl. D7—398

274,032
MULTI-PURPOSE HAND TOOL
Kwok C. Lai, 9-11, Cheong Wing Rd., Tung Chun Industrial Bldg., Block E, 23rd Floor, Kwai Chung, Hong Kong
Filed Feb. 24, 1982, Ser. No. 351,931
Claims priority, application United Kingdom, Oct. 6, 1981, 1 002 865
Term of patent 14 years
U.S. Cl. D8—55

274,033
DRILL GUIDE
Lawrence L. Miller, 2030 S. Irving, Denver, Colo. 80219
Filed Jul. 20, 1981, Ser. No. 285,069
Term of patent 14 years
U.S. Cl. D8—71

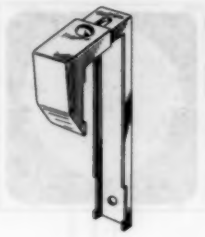


274,034
WORK PIECE PROTECTING PAD FOR USE ON A BAR CLAMP, OR SIMILAR ARTICLE
Erciel F. Lacina, 17645 Arrow Blvd., Fontana, Calif. 92335
Filed Jan. 19, 1982, Ser. No. 340,745
Term of patent 14 years
U.S. Cl. D8—72

274,035
PULL
Valentin Pawlow, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Dec. 21, 1981, Ser. No. 333,033
Term of patent 14 years
U.S. Cl. D8—316

274,036
GAMBREL HANGER FOR LARGE ANIMAL
Eugene C. Schraml, Brookfield, Wis., assignor to G & R Machine & Vending, Inc., Brookfield, Wis.
Filed Jun. 23, 1982, Ser. No. 391,337
Term of patent 14 years
U.S. Cl. D8—370

274,037
HANGER BRACKET FOR POCKET FILE
Phillip A. Crim, Clark County; Larry S. Hawkins, Frederick County, and Michael J. Szablak, Winchester, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Aug. 17, 1981, Ser. No. 293,379
Term of patent 14 years
U.S. Cl. D8—373



274,038
PELICAN HOOK
Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.
Filed Sep. 2, 1981, Ser. No. 298,650
Term of patent 14 years
U.S. Cl. D8—382

274,039
BOTTLE
Nusri M. Abraham, Cornwall, Canada, assignor to Corbron Foundries, Cornwall, Canada
Filed Sep. 9, 1981, Ser. No. 300,704
Claims priority, application Canada, Jun. 17, 1981, 17-06-81-2
Term of patent 14 years
U.S. Cl. D9—323

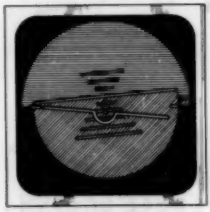
274,040
VITAMIN DISPENSER
Brad J. Ridgley, 16881 Oakview Dr., Encino, Calif. 91436
Filed Dec. 24, 1981, Ser. No. 334,314
Term of patent 14 years
U.S. Cl. D9—339

274,041
CORNER PAD
Hideo Kato, Tokyo, Japan, assignor to Fukuoka Paper Manufacturing Co., Ltd., Fukuoka, Japan
Filed Oct. 26, 1981, Ser. No. 315,069
Claims priority, application Japan, Jul. 11, 1981, 56/030474
Term of patent 14 years
U.S. Cl. D9—434

274,042
TRAVELING CLOCK
Giovanni Bulgari, Rome, Italy, assignor to Anthos S.A., Geneva, Switzerland
Filed Dec. 18, 1981, Ser. No. 332,224
Claims priority, application Hague, Jun. 25, 1981, DM/000 831
Term of patent 14 years
U.S. Cl. D10—18

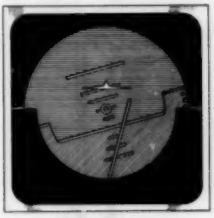
274,043
DIFFERENTIAL TEMPERATURE CONTROL
Larry W. Paine, 2345 Pebble Beach Dr., Evergreen, Colo. 80439
Filed Mar. 16, 1982, Ser. No. 408,112
Term of patent 14 years
U.S. Cl. D10—50

274,044
ATTITUDE DIRECTOR INDICATOR
Donald F. Schmidt, Cedar Rapids, Iowa, and Siegfried Knemeyer, deceased, late of Yellow Springs, Ohio (by Doris R. Knemeyer, administrator), assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 27, 1982, Ser. No. 343,067
Term of patent 14 years
U.S. Cl. D10—74



274,045
ATTITUDE DIRECTOR INDICATOR
Donald F. Schmidt, Cedar Rapids, Iowa, and Siegfried Knemeyer, deceased, late of Yellow Springs, Ohio (by Doris R. Knemeyer, administrator), assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 27, 1982, Ser. No. 343,068
Term of patent 14 years
U.S. Cl. D10—74

274,046
ATTITUDE DIRECTOR INDICATOR
Donald F. Schmidt, Cedar Rapids, Iowa, and Siegfried Knemeyer, deceased, late of Yellow Springs, Ohio (by Doris R. Knemeyer, administrator), assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 27, 1982, Ser. No. 343,069
Term of patent 14 years
U.S. Cl. D10—74

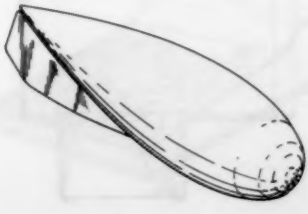


274,047
ATTITUDE DIRECTOR INDICATOR
Donald F. Schmidt, Cedar Rapids, Iowa, and Siegfried Knemeyer, deceased, late of Yellow Springs, Ohio (by Doris R. Knemeyer, administrator), assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 27, 1982, Ser. No. 343,070
Term of patent 14 years
U.S. Cl. D10—74

274,048
ELECTRONIC ALARM
Ka W. Wong, Ngau Tau Kok, and Albert K. H. Au, Wanchai, both of China, assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 30, 1981, Ser. No. 335,954
Term of patent 14 years
U.S. Cl. D10—106

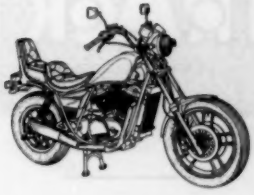
274,049
WIND CHIME
Vern Stilson, 4006 Main St., Erie, Pa. 16511
Filed Oct. 10, 1980, Ser. No. 196,105
Term of patent 14 years
U.S. Cl. D10—116

274,050
TOWABLE BUOYANT BODY
Helge Brandsaeter, Stabekk, Norway, assignor to Geophysical Company of Norway A/S, Hovik, Norway
Filed Feb. 19, 1981, Ser. No. 235,952
Claims priority, application Norway, Jan. 22, 1981, 61686
Term of patent 14 years
U.S. Cl. D12—300

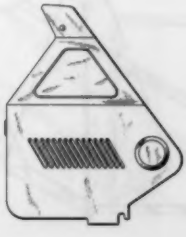


274,051
VEHICLE TIRE
Shinichiro Ohkuni, Tokyo, and Hideaki Nishio, Saitama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Nov. 25, 1981, Ser. No. 324,888
Claims priority, application Japan, May 29, 1981, 56-22942
Term of patent 14 years
U.S. Cl. D12—146

274,052
MOTORCYCLE
Masato Iwakura, Asaka; Mutsuo Hirose, and Toshiyuki Yamada, both of Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1982, Ser. No. 450,731
Claims priority, application Japan, Jun. 22, 1982, 57/28084
Term of patent 14 years
U.S. Cl. D12—110

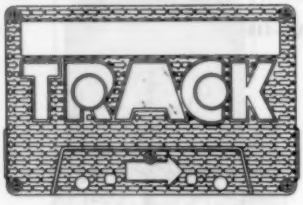


274,053
MOTORCYCLE SIDE COVER
Alwin J. Stahel, Saint Paul, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed Jul. 1, 1981, Ser. No. 279,576
Term of patent 14 years
U.S. Cl. D12—126



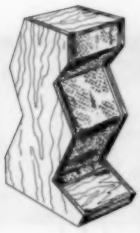
274,054
ADJUSTABLE WING MIRROR ATTACHABLE TO THE REAR VIEW MIRROR OF AN AUTOMOBILE, OR SIMILAR ARTICLE
Robert C. Barows, P.O. Box 543, Lake Arrowhead, Calif. 92352
Filed Nov. 30, 1981, Ser. No. 325,973
Term of patent 14 years
U.S. Cl. D12—187

274,055
TAPE CARTRIDGE
Anders Wester, Malmö, Sweden, assignor to Track Tape AB, Sweden
Filed Dec. 1, 1981, Ser. No. 326,372
Claims priority, application Sweden, Jun. 2, 1981, 811273
Term of patent 14 years
U.S. Cl. D14—11

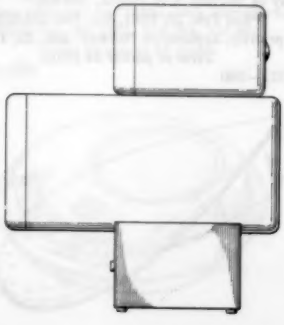


274,056
COMBINED SPEAKER HOUSING AND LIGHT DISPLAY
Fritz Myer, 135 Park Pl., Battle Creek, Mich. 49015
Filed Aug. 20, 1981, Ser. No. 294,727
Term of patent 14 years
U.S. Cl. D14—33

274,057
AUDIO SPEAKER CABINET
Dale Carter, 5004 West Huron, Chicago, Ill. 60644
Filed Jan. 11, 1982, Ser. No. 338,633
Term of patent 14 years
U.S. Cl. D14—33



274,058
LOUDSPEAKER
Bill Gross, 1244 E. Colorado Blvd., Pasadena, Calif. 91106
Filed Dec. 22, 1981, Ser. No. 333,624
Term of patent 14 years
U.S. Cl. D14—34

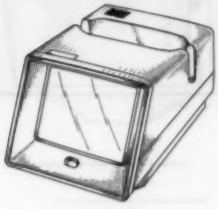


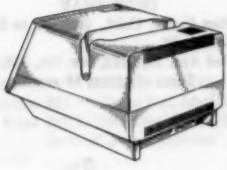
274,059

HOUSING FOR A GRAPHIC TELEPHONE

Jack P. Hall; Richard Fayram, both of Palo Alto, and Jeffrey Muscatine, San Jose, all of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 25, 1982, Ser. No. 352,243
Term of patent 14 years
U.S. Cl. D14—54





274,060

PATIENT COMMUNICATOR

W. Fletcher Bennet, Groton, Mass., assignor to Sontek Industries, Inc., Dallas, Tex.

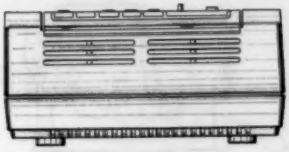
Filed Dec. 2, 1981, Ser. No. 326,492
Term of patent 14 years
U.S. Cl. D14—68

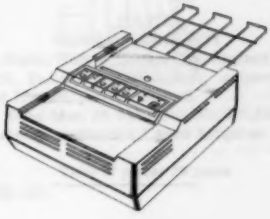
274,061

FACSIMILE TRANSCEIVER

Masatsugu Suzuki, and Naotoshi Iwasa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,902
Term of patent 14 years
U.S. Cl. D14—94



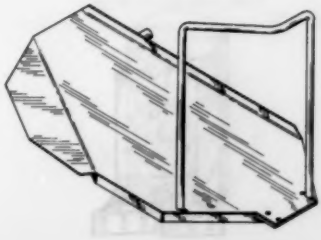


274,062

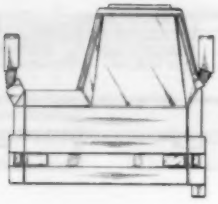
CROPPER PLATFORM FOR A TOBACCO HARVESTING MACHINE

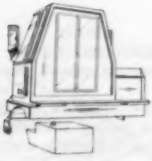
Elmer K. Hansen, 801 S. Martha, Sioux City, Iowa 51106

Filed Nov. 30, 1981, Ser. No. 326,113
Term of patent 14 years
U.S. Cl. D15—27

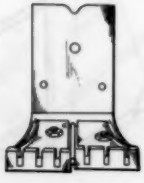


274,063
YARD TRACTOR CAB
Ronald V. Skaff, Sausalito, and William Giobbi, Tiburon, both of Calif., assignors to A G Motor Corp., Fresno, Calif.
Filed Feb. 23, 1982, Ser. No. 351,497
Term of patent 14 years
U.S. Cl. D15—30



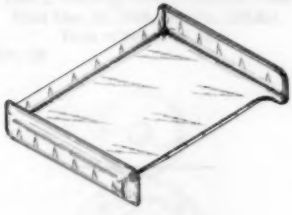


274,064
TAILPIECE FOR GUITAR
Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Nagoya, Japan
Filed Dec. 24, 1981, Ser. No. 334,176
Term of patent 14 years
U.S. Cl. D17—21



274,065
COMBINED HOLDER FOR VISITING CARDS, MEMO SHEETS AND A WRITING INSTRUMENT
Maurice Goutchat, 7, Grande Rue, 78850 Thiverval, France
Filed Dec. 3, 1981, Ser. No. 326,449
Claims priority, application France, Aug. 24, 1981, 81 2948
Term of patent 14 years
U.S. Cl. D19—78

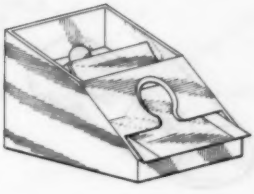
274,066
DESK TRAY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Apr. 15, 1982, Ser. No. 368,713
Term of patent 14 years
U.S. Cl. D19—92



274,067
PAPER TRAY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jun. 21, 1982, Ser. No. 390,343
Term of patent 14 years
U.S. Cl. D19—92

274,068
GLASS ROSETTE FOR ENCLOSING CHANDELIER SOCKETS AND LIGHTBULBS OR THE LIKE
Igor Sverdlin, 1213 Neilson St., Apt. 5E, Far Rockaway, N.Y. 11691
Filed Dec. 14, 1981, Ser. No. 330,149
Term of patent 14 years
U.S. Cl. D26—138

274,069
DISPENSER FOR PLAYING CARDS OR THE LIKE
Stephen J. Fromm, 533 N. Shore Rd., Absecon, N.J. 08201
Filed Jul. 2, 1981, Ser. No. 279,766
Term of patent 14 years
U.S. Cl. D21—57

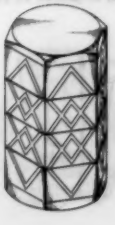


274,070
BALL TOY
Hansan Ma, Hoffman Estates, Ill., assignor to Milton Bradley International, Inc., Springfield, Mass.
Filed Feb. 12, 1982, Ser. No. 348,443
Term of patent 14 years
U.S. Cl. D21—59

274,071
CHILD'S CRIB TOY
Norman R. Emms, Welwyn Garden City, England, and Peter D. Bryant, St. Helier, Channel Islands, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed Mar. 19, 1982, Ser. No. 359,688
Claims priority, application United Kingdom, Dec. 3, 1981, 1003969
Term of patent 14 years
U.S. Cl. D21—149

274,072
CHILD'S CRIB TOY
Norman R. Emms, Welwyn Garden City, England, and Peter D. Bryant, St. Helier, Channel Islands, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed Mar. 19, 1982, Ser. No. 359,693
Claims priority, application United Kingdom, Dec. 3, 1981, 1003970
Term of patent 14 years
U.S. Cl. D21—63

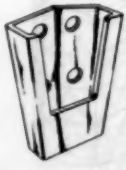
274,073
HEXAGONAL TWIST PUZZLE OR THE LIKE
Tonney Tung, Taipei, Taiwan, assignor to J.A.R. Sales, Inc., Santa Monica, Calif.
Filed Feb. 16, 1982, Ser. No. 349,178
Term of patent 14 years
U.S. Cl. D21—107



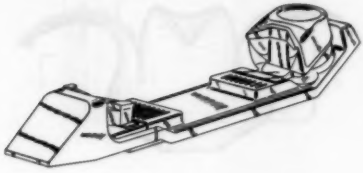
274,074
SECTIONAL PUZZLE
Randy G. Brunko, R.R. #1, Bertha, Minn. 56437
Filed Jul. 1, 1982, Ser. No. 394,271
Term of patent 14 years
U.S. Cl. D21—107

274,075
PULL TOY
Walter P. Doe, 292 Center St., East Aurora, N.Y. 14052
Filed Dec. 14, 1981, Ser. No. 330,219
Term of patent 14 years
U.S. Cl. D21—150

274,076
SUPPORT FOR DOORWAY EXERCISER OR SIMILAR ARTICLE
Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Inc., Pasadena, Calif.
Filed Aug. 10, 1981, Ser. No. 291,437
Term of patent 14 years
U.S. Cl. D21—191

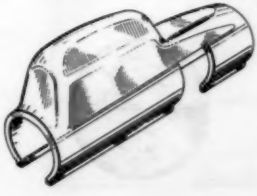


274,077
SKI BINDING
Hermann R. Segers, Munich, and Herbert H. Schultes, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Marker-Patentverwertungsgesellschaft mbH., Bear, Switzerland
Filed Aug. 4, 1981, Ser. No. 290,010
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, MR12400
Term of patent 14 years
U.S. Cl. D21—230



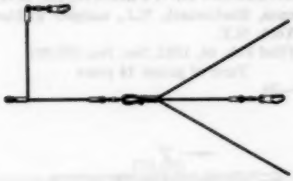
274,078
WATER WALKER
Fred N. Bland, Rte. 2, Box 103 K, Joelton, Tenn. 37080
Filed Nov. 12, 1981, Ser. No. 320,667
Term of patent 14 years
U.S. Cl. D21—238

274,079
COVER FOR A RIFLE SIGHT
Ronald J. Schuster, P.O. Box 92, Claremont, Minn. 55924
Filed Feb. 8, 1982, Ser. No. 346,491
Term of patent 14 years
U.S. Cl. D22—7

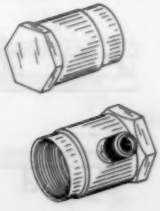


274,080
COMBINED FISH HOOK SET AND FISH LINE SNUBBER
Dale E. Hall, 9255 Defiance Cir., Sacramento, Calif. 95827
Filed May 10, 1982, Ser. No. 376,990
Term of patent 14 years
U.S. Cl. D22—30

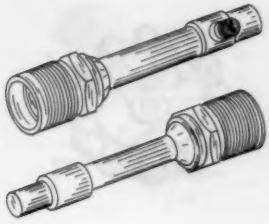
274,081
BOTTOM BOUNCER FOR TROLLING
Ronald E. Smith, P.O. Box 772, R.R. 1, Mitchell, S. Dak. 57301
Filed Jul. 9, 1982, Ser. No. 396,630
Term of patent 14 years
U.S. Cl. D22—30



274,082
SAFETY FLUSH VALVE FITTING FOR AUTOMOTIVE AIR CONDITIONER
Harrison Burruss, 3120 Teton Cir., Huntsville, Ala. 35810
Filed Aug. 17, 1981, Ser. No. 293,287
Term of patent 14 years
U.S. Cl. D23—21



274,083
SAFETY FLUSH VALVE FITTING FOR AUTOMOTIVE AIR CONDITIONER
Harrison Burruss, 3120 Teton Cir., Huntsville, Ala. 35810
Filed Aug. 17, 1981, Ser. No. 293,288
Term of patent 14 years
U.S. Cl. D23—21



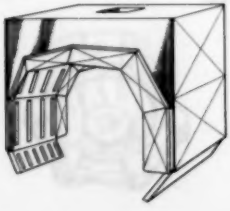
274,084
VALVE HANDWHEEL
Sori Yanagi, Tokyo, Japan, assignor to Kitz Corporation, Tokyo, Japan
Filed Sep. 3, 1981, Ser. No. 299,100
Term of patent 14 years
U.S. Cl. D23—30

274,085
VALVE HANDWHEEL
Sori Yanagi, Tokyo, Japan, assignor to KITZ Corporation, Tokyo, Japan
Filed Sep. 3, 1981, Ser. No. 299,138
Term of patent 14 years
U.S. Cl. D23—30

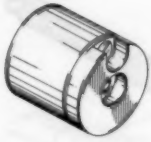
274,086
VALVE HANDWHEEL
Sori Yanagi, Tokyo, Japan, assignor to NSK-Warner K.K., Tokyo, Japan
Filed Sep. 3, 1981, Ser. No. 299,145
Claims priority, application Japan, Dec. 26, 1979, 54-445
Term of patent 14 years
U.S. Cl. D23—30

274,087
VALVE HANDWHEEL
Sori Yanagi, Tokyo, Japan, assignor to KITZ Corporation, Tokyo, Japan
Filed Sep. 3, 1981, Ser. No. 299,583
Term of patent 14 years
U.S. Cl. D23—30

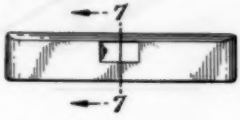
274,088
TRAVELLING CARRIER FOR HEATING ELEMENTS IN A PAINT SPRAY BOOTH
Hans E. Nilsson, Henan, and Ake Carlsson, Trollhättan, both of Sweden, assignors to Infrarodteknik AB, Vanersborg, Sweden
Filed Dec. 2, 1981, Ser. No. 326,404
Term of patent 14 years
U.S. Cl. D23—77



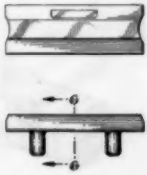
274,089
LASER FOR WEAPON SIMULATOR SYSTEM
James F. Morris, Jr., Apopka; Ramon Visovatti, Orlando, and Richard J. Wangler, Maitland, all of Fla., assignors to International Laser Systems, Inc., Orlando, Fla.
Filed Jan. 4, 1982, Ser. No. 337,030
Term of patent 14 years
U.S. Cl. D24—8



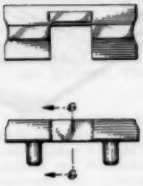
274,090
TRANSVERSE TIBIAL CUTTING JIG FOR THE IMPLANTATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.N.Y.
Filed Feb. 18, 1982, Ser. No. 350,007
Term of patent 14 years
U.S. Cl. D24—26



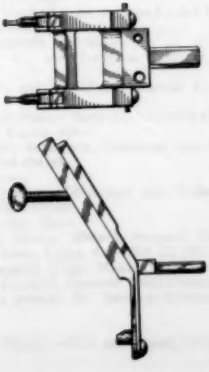
274,091
FEMORAL CHAMFER CUTTING JIG FOR THE IMPLANTATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.Y.
Filed Feb. 18, 1982, Ser. No. 350,008
Term of patent 14 years
U.S. Cl. D24—26



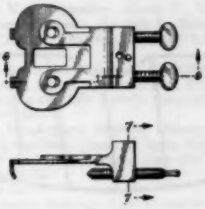
274,092
FEMORAL CHAMFER CUTTING JIG FOR THE IMPLANTATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.Y.
Filed Feb. 18, 1982, Ser. No. 350,009
Term of patent 14 years
U.S. Cl. D24—26



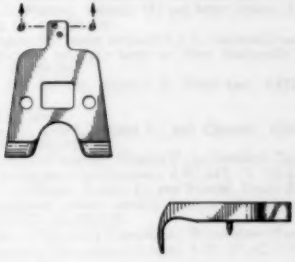
274,093
FEMORAL SPACER/TENSOR JIG FOR THE IMPLANTATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.Y.
Filed Feb. 18, 1982, Ser. No. 350,011
Term of patent 14 years
U.S. Cl. D24—26



274,094
TIBIAL POSITIONING/FIXATION JIG FOR THE IMPLANATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.Y.
Filed Feb. 18, 1982, Ser. No. 350,113
Term of patent 14 years
U.S. Cl. D24—26



274,095
FEMORAL DRILL JIG FOR THE IMPLANTATION OF A PROSTHETIC KNEE
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., New York, N.Y.
Filed Feb. 18, 1982, Ser. No. 350,125
Term of patent 14 years
U.S. Cl. D24—26



274,096
SURGICAL FORCEPS
George V. Shutt, 918 Willow Springs La., Glendora, Calif. 91740
Filed Feb. 16, 1982, Ser. No. 348,696
Term of patent 14 years
U.S. Cl. D24—27

274,097

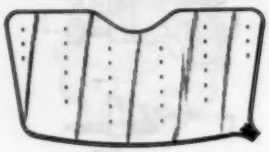
HEAT THERAPEUTIC BELT

Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Kenshiun Ishii, both of Tokyo, all of Japan, assignors to Combi Co. Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,272

Term of patent 14 years

U.S. Cl. D24—34



274,098

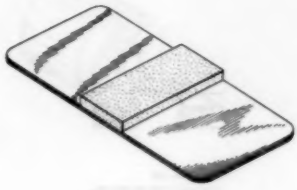
DISPOSABLE SWAB APPLICATOR PACKAGE WITH STANDBY RESERVOIR

Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Division of Ser. No. 246,379, Mar. 23, 1981. This application Aug. 18, 1983, Ser. No. 524,419

Term of patent 14 years

U.S. Cl. D24—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. R. Wilfley and Sons, Inc.: *See*—
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,451,155, Cl. 366-265.000.

AAKAC Industries, Inc.: *See*—
Williams, John E., Jr., 4,451,065, Cl. 280-284.000.

Aalbertsberg, Frederik W.: *See*—
Classens, Adrianus M. M.; Aalbertsberg, Frederik W.; and Van Marle, Hendrika G., 4,451,692, Cl. 174-23.00C.

AB Stil-Industri: *See*—
Sylven, Hans, 4,451,060, Cl. 280-801.000.

Abbott Laboratories: *See*—
Bujan, Albert F.; and Harms, Jack L., 4,451,255, Cl. 604-157.000.
Flentge, Charles A.; and Kirkemo, Curtis L., 4,451,652, Cl. 544-229.000.

Abe, Masaharu: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Ishiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.

Abe, Seiko; Igashira, Toshihiko; and Watanabe, Kazuhide, to Nippon Soken, Inc. Fuel evaporator for internal combustion engine. 4,450,823, Cl. 123-549.000.

ABL Engineering Ltd.: *See*—
Driedger, Klaus U., 4,450,657, Cl. 52-79.900.

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Fischer, David A., 4,450,834, Cl. 128-92.0EB.

Acker, Richard C., to Teledyne Republic Manufacturing. Pilot-operated valve. 4,450,869, Cl. 137-625.480.

Acomb, Byron H., to Union Carbide Corporation. Gas pressure reducing regulator. 4,450,858, Cl. 137-505.370.

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Gwozdz, Peter S., 4,451,326, Cl. 156-643.000.

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Hartemink, Gerrit A., 4,450,718, Cl. 73-202.000.

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Wood, Robert L., 4,451,240, Cl. 441-129.000.

Agatsuma, Kenji: *See*—
Itoh, Hideo; and Agatsuma, Kenji, 4,451,745, Cl. 307-475.000.

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Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,451,678, Cl. 568-902.000.
Terada, Shoji, 4,451,415, Cl. 264-43.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Dolezalek, Friedrich; Koepke, Gunther; and Rendelmann, Ulrich, 4,451,497, Cl. 427-39.000.
Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, 4,451,011, Cl. 242-71.000.

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Pollet, Robert J.; Vandenberghe, Antoon L.; and Spriet, Roger A., 4,451,555, Cl. 430-445.000.

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Cheng, John T. C.; and Langsam, Michael, 4,451,625, Cl. 526-62.000.
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Klee, David J.; and Nelson, Peter C., 4,451,002, Cl. 236-101.00R.

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Harada, Kuniyoshi; Suzumura, Nobuyasu; and Fujie, Naofumi, 4,451,887, Cl. 364-424.000.

Ajima, Shigetoshi: *See*—
Fujimaki, Hiroto; Ajima, Shigetoshi; and Watanabe, Kazuhiro, 4,451,590, Cl. 523-155.000.

Ajinomoto Company, Inc.: *See*—
Yasuda, Naohiko; Okutsu, Masaru; Iwagami, Hisao; Nakamiya, Teruaki; and Takase, Ichiro, 4,451,399, Cl. 260-239.100.

Akagi, Takao; Yamaguchi, Shinji; Maeda, Katsura; and Yamamoto, Kazuo, to Kuraray Co., Ltd. Synthetic fibers imparted with an irregular surface and a process for their production. 4,451,534, Cl. 428-372.000.

Akashi, Goro: *See*—
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, 4,451,501, Cl. 427-40.000.

Akifiev, Oleg N.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

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Akita, Yoshio; Teshima, Takanori; Maruyama, Toshinori; and Torii, Koshi, to Nippondenso Co., Ltd. Vehicle mounted voltage regulator. 4,451,774, Cl. 320-64.000.

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Aldava, Michael B.: *See*—
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Alioa, Daniel; and Stevens, Richard E. Hand cart. 4,451,053, Cl. 280-47.260.

Allard, Roland L.: *See*—
Huc, Alain R.; Allard, Roland L.; and Chavrier, Christian L., 4,451,397, Cl. 260-123.700.

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Belden, Reed H.; Li, Hsin L.; and Sawheny, Dulari L., 4,450,891, Cl. 164-463.000.
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,450,607, Cl. 28-257.000.
Li, Hsin L., 4,450,997, Cl. 226-97.000.

Allied Gator, Inc.: *See*—
Ramun, Michael; and Ramun, John, 4,450,625, Cl. 30-134.000.

Allingham, Robert P.: *See*—
Weeks, Paul D.; and Allingham, Robert P., 4,451,661, Cl. 549-417.000.

Allison, William D. Vehicle suspension system. 4,451,054, Cl. 280-104.000.

Alper, Daniel D., to Burroughs Corp. Constant spacing document feeder. 4,451,027, Cl. 271-10.000.

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Libby, Stephen C., 4,451,443, Cl. 423-432.000.
Prescott, Ernest; and Cochran, William C., 4,451,302, Cl. 148-13.100.

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Bauer, Carl F.; Hussey, James H.; and Langston, Benny, 4,451,287, Cl. 75-24.000.
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Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,451,479, Cl. 424-273.00P.

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American Interpac Corporation: *See*—
Herrera-Gutierrez, Jesus, 4,451,246, Cl. 493-215.000.
American Safety Equipment Corporation: *See*—
Ziv, Avraham, 4,451,062, Cl. 280-806.000.
Amersham International plc: *See*—
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AMF Inc.: *See*—
Bains, James A., Jr., 4,451,797, Cl. 330-134.000.
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Beinhaur, Ernest L., 4,451,696, Cl. 174-92.000.
Bianchi, Edward A., 4,450,621, Cl. 29-828.000.
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Grabbe, Dimitry; Bakermans, Johannes C. W.; Cosmo, Nicola; and Korsunsky, Ionif, 4,451,818, Cl. 339-75.0MP.
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Noel, Stan L., 4,451,859, Cl. 360-75.000.
Amrany, Daniel, to Intel Corporation. MOS High voltage switching circuit. 4,451,748, Cl. 307-578.000.
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Ancona, Frank A. Bottom fishing lure. 4,450,645, Cl. 43-42.250.
Anderson, Carl P., to Ricoh Systems, Inc. Electrophotographic copying apparatus having an automatic feed arrangement and an end-of-feed sensing assembly. 4,451,138, Cl. 355-14.0SH.
Anderson, James W., to Anderson, Sarah, a part interest. Moisture tester. 4,451,781, Cl. 324-65.00R.
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Anderson, James W., 4,451,781, Cl. 324-65.00R.
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Ando, Takao: *See*—
Yoshikumi, Chikao; Sakurai, Katsuo; Omura, Yoshio; Nohara, Mayumi; Ando, Takao; and Motokawa, Isamu, 4,451,457, Cl. 424-180.000.
Andoh, Akiwo: *See*—
Ohkubo, Tadahiko; Endo, Tetsuhiko; and Andoh, Akiwo, 4,451,007, Cl. 242-18.00R.
Andreev, Anatoly A.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.
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Alfio, Po, 4,450,757, Cl. 99-327.000.
Angle, Ellwyn R.; and Wilkerson, John L., to Hughes Aircraft Company. Radio frequency laser pumping system. 4,451,766, Cl. 315-248.000.
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., to SCA Development Aktiebolag. Method for delignification of ligno-cellulose containing fiber material with an alkali-oxygen extraction stage. 4,451,332, Cl. 162-30.100.
Anthony, Frank H.; and Coy, Vernon W., to Anthony, Frank H. Kiln temperature control device. 4,451,726, Cl. 219-413.000.
Aoki, Hideki: *See*—
Okuda, Kensuke; Nagai, Hirosi; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, 4,451,235, Cl. 433-201.000.
Aoyagi, Kenichi: *See*—
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,450,803, Cl. 123-308.000.
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Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,451,893, Cl. 364-494.000.
Aoyama, Kikuro, to Nippon Gakki Seizo Kabushiki Kaisha. Muffler assembly for a piano. 4,450,747, Cl. 84-220.000.
Applegate, Clark L.: *See*—
Minnich, George E.; and Applegate, Clark L., 4,451,769, Cl. 318-689.000.
Arai, Masayuki; and Ogasawara, Terumi, to Asahi Seimitsu Kabushiki Kaisha. Automatic diaphragm control device for a closed circuit television camera. 4,451,851, Cl. 358-228.000.
Archer, John R.: *See*—
McGlashan, Kenneth W.; and Archer, John R., 4,451,807, Cl. 335-211.000.
Ares, Inc.: *See*—
Gillum, Richard R., 4,450,750, Cl. 89-33.0SF.
Arfaei, Ahmad: *See*—
Bennett, Everett W.; and Arfaei, Ahmad, 4,451,550, Cl. 430-176.000.
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Vallee, Antoine; and Goguelin, Michel, 4,451,539, Cl. 428-515.000.
Armco Inc.: *See*—
Cowan, William S., 4,451,170, Cl. 403-57.000.
Galle, Edward M., Jr., 4,451,056, Cl. 285-3.000.
Armour Pharmaceutical Company: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,451,395, Cl. 260-112.50T.
Arnold, Bruce C., to Twin Disc, Incorporated. Shaft brake for marine propulsion system. 4,451,238, Cl. 440-75.000.
Arrhenius, Gustaf O., to American Hospital Supply Corporation. Recyclable hot pad. 4,451,383, Cl. 252-70.000.
Arrow Machine, Inc.: *See*—
Ricard, Paul R.; and Goclowski, Charles, 4,450,707, Cl. 72-389.000.
Arvidsson, Ulf K.; and Gidlund, Per A. L., to Atlas Copco Aktiebolag. Power operated percussion tool having gripping means. 4,450,921, Cl. 173-162.00H.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ikegami, Tadashi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,451,573, Cl. 502-113.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Sato, Shigetada, 4,451,125, Cl. 350-465.000.
Asahi Seimitsu Kabushiki Kaisha: *See*—
Arai, Masayuki; and Ogasawara, Terumi, 4,451,851, Cl. 358-228.000.
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Asbury, Charles E.: *See*—
Clausen, Victor H.; and Asbury, Charles E., 4,451,515, Cl. 428-112.000.
Aschauer, Heinz: *See*—
Vertesy, Laszlo; Mracek, Miroslav; Braunitzer, Gerhard; and Aschauer, Heinz, 4,451,455, Cl. 424-177.000.
ASEA Aktiebolag: *See*—
Brogardh, Torgny; Engstrom, Olof; and Ovren, Christer, 4,451,730, Cl. 250-227.000.
Ashida, Hitoshi, to Takeda Riken Kogyo Kabushiki Kaisha. Spectrum analyzer. 4,451,782, Cl. 324-77.00C.
Ashland Oil, Inc.: *See*—
Grote, Dace; Grimm, Robert A.; and Norton, Richard V., 4,451,670, Cl. 562-606.000.
Ashley, Jonathan J. Tabular puzzle. 4,451,040, Cl. 273-153.00S.
Ashley, W. B.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.
Asnis, Stanley E.; and Borzone, Rocco R., to Howmedica, Inc. Method and system for inserting a surgical wire. 4,450,835, Cl. 128-92.0EB.
Assent, Hans C.: *See*—
Tecl, Bohuslav; Fahrbach, Erich; Knoke, Jurgen; and Assent, Hans C., 4,451,520, Cl. 428-198.000.
Aswell, Cecil J., to Mostek Corporation. Power supply control for integrated circuit. 4,451,742, Cl. 307-66.000.
AT&T Technologies, Inc.: *See*—
Hodgson, Sten E.; and Gemra, Richard J., 4,451,104, Cl. 339-99.00R.
Ataka, Tatsuaki: *See*—
Itaya, Kingo; Shibayama, Kimio; Toshima, Shinobu; Ataka, Tatsuaki; and Iwasa, Koji, 4,451,348, Cl. 204-290.00R.
Atanassov, Haralampi A.: *See*—
Makedonski, Boris G.; and Atanassov, Haralampi A., 4,451,269, Cl. 51-303.000.
Atari, Inc.: *See*—
Mayer, Steven T.; and Emmons, Lawrence D., 4,451,900, Cl. 364-900.000.
Atchley, Frank W. Surgical aspirator with poppet control valve. 4,451,257, Cl. 604-119.000.
Atkins, Ronald L.; Hollins, Richard A.; Norris, William P.; Nielsen, Arnold T.; and Wilson, William S., to United States of America, Navy. Methods of preparing pentanitrotoluene. 4,451,681, Cl. 568-932.000.
Atkinson, Ivor B.; and Holdstock, Barry C. Hydrogel contact lenses for permanent wear. 4,451,630, Cl. 526-261.000.
Atlantic Richfield Company: *See*—
Grey, Roger A., 4,451,672, Cl. 568-384.000.
Khac, Bi L., 4,451,617, Cl. 525-203.000.
Lichtin, Norman N.; and Vijayakumar, Kalambella M., 4,451,342, Cl. 204-157.10R.
Sofranko, John A.; and Gaffney, Anne M., 4,451,666, Cl. 560-204.000.
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Arvidsson, Ulf K.; and Gidlund, Per A. L., 4,450,921, Cl. 173-162.00H.
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Schaper, Siefried, 4,450,610, Cl. 29-156.50R.
Auinger, Herbert, to Siemens Aktiengesellschaft. Three-phase winding for a high-voltage machine. 4,451,751, Cl. 310-184.000.
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Buckner, John G.; Lineberry, Cletus E.; and Harris, Jimmy W., 4,450,739, Cl. 83-23.000.
Automated Production Systems Corporation: *See*—
Twyman, Noel H., 4,451,352, Cl. 208-11.00R.

Avco Corporation: *See*—
Libertini, Zoltan L.; and Hartel, Edward O., 4,451,200, Cl. 415-110.000.
Naik, Subhash K., 4,451,431, Cl. 420-588.000.

Avery, Ronald G.; and Kahl, William G., Jr., to Cerberus AG. Infrared intrusion detector with optical pattern locators. 4,451,733, Cl. 250-342.000.

AVX Corporation: *See*—
Philofsky, Elliott; Parkinson, Ward; and Wilson, Dennis, 4,451,845, Cl. 357-72.000.

Awano, Toshimi: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,042, Cl. 273-171.000.

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Silvestrini, Bruno; and Baiocchi, Leandro, 4,451,477, Cl. 424-273.00N.

Azuma, Yoshimasa: *See*—
Sakabe, Yukio; Nishioka, Goro; Azuma, Yoshimasa; and Mori, Susumu, 4,451,869, Cl. 361-309.000.

Azumi, Ichiro: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.

B. F. Goodrich Company, The: *See*—
Genovese, David E., 4,451,016, Cl. 244-107.000.
Lee, Biing-Lin, 4,451,595, Cl. 523-351.000.
Okamoto, Yoshihisa, 4,451,618, Cl. 525-349.000.

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Keyes, Marion A., IV; and Salmen, Richard A., deceased, 4,450,722, Cl. 73-293.000.
Orcutt, Donald R., 4,450,872, Cl. 138-149.000.

Babczinski, Peter: *See*—
Knops, Hans-Joachim; Babczinski, Peter; Eue, Ludwig; and Schmidt, Robert, 4,451,282, Cl. 71-92.000.

Bader Brothers Limited: *See*—
Bader, Robert, 4,450,638, Cl. 40-158.00R.

Bader, Robert, to Bader Brothers Limited. Photograph display device. 4,450,638, Cl. 40-158.00R.

Bagshaw, David P.: *See*—
Duval, Eugene F.; Bagshaw, David P.; Kast, Michael A.; Masters, Gilbert M.; and Whitehouse, Harry T., 4,450,868, Cl. 137-625.290.

Bailey, Alfred J., to Massey-Ferguson Services N.V. Seed drills. 4,450,779, Cl. 111-52.000.

Bailey, Hillard W. Nutcracker table. 4,450,761, Cl. 99-580.000.

Bains, James A., Jr., to AMF Inc. AGC Controller for pulsed system. 4,451,797, Cl. 330-134.000.

Baiocchi, Leandro: *See*—
Silvestrini, Bruno; and Baiocchi, Leandro, 4,451,477, Cl. 424-273.00N.

Baird, Phillips C.; and Duff, Raymond J., to Isotronics, Inc. System for packaging of electronic circuits. 4,451,540, Cl. 428-615.000.

Baker, Joseph W.; Mansfield, Dennis L.; and Weinkauff, David J., to Monsanto Company. Animal feed supplement having reduced corrosion characteristics. 4,451,486, Cl. 424-317.000.

Baker Oil Tools, Inc.: *See*—
Callihan, Rudy B.; and Stone, Lyndon R., 4,450,912, Cl. 166-289.000.

Baker, Wilfred E.: *See*—
Sperrazza, Joseph; Liu, James C. C.; and Baker, Wilfred E., 4,451,178, Cl. 405-258.000.

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Grabbe, Dimitry; Bakermans, Johannes C. W.; Cosmo, Nicola; and Korsunsky, Iosif, 4,451,818, Cl. 339-75.0MP.

Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, to Richter Gedeon Vegyeszeti Gyar Rt. Apparatus for producing tempered plate parts. 4,450,608, Cl. 29-33.00R.

Ball, Geoffrey W. Gas monitor. 4,451,816, Cl. 338-34.000.

Bandura, Vitaly: *See*—
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,450,619, Cl. 29-564.100.

Bank, Willaim: *See*—
Shapiro, Jay B.; and Bank, Willaim, 4,450,640, Cl. 40-596.000.

Banks, Ridgway M. Single wire nitinol engine. 4,450,686, Cl. 60-527.000.

Bano, Tibor: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.00R.

Bansal, Anil: *See*—
Cheney, Richard F.; Bansal, Anil; and Kimmel, Edward R., 4,450,724, Cl. 73-432.00R.

Bapst, Jean-Daniel: *See*—
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Barabas, Eugene S., to GAF Corporation. Rust removal process. 4,451,296, Cl. 134-4.000.

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Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Barber, James C., to James C. Barber and Associates, Inc. Production of fluid fertilizer from phosphorus furnace waste stream. 4,451,277, Cl. 71-36.000.

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Barclay, John D.; and Harmon, Rawson B., Jr., to Barclay, John D.; Harmon, Rawson B., Jr.; and McIntosh, John N. Additive for improving performance of liquid hydrocarbon fuels. 4,451,266, Cl. 44-53.000.

Barlow, Anthony; and Meeks, Lawrence A., to National Distillers and Chemical Corporation. Heat distortion-resistant thermoplastic semiconductive composition. 4,451,536, Cl. 428-383.000.

Barmotin, Georgy V.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

Barney, George M.; and Michaelis, Paul R., to Texas Instruments Incorporated. Miniature biofeedback instrument. 4,450,843, Cl. 128-690.000.

Barrows, Robert E.: *See*—
Davenport, Henry A.; and Barrows, Robert E., 4,450,938, Cl. 184-42.000.

Barry, Leon G.; and Rieman, Willis E., to Fasco Controls Corporation. Non-resettable thermal fuse. 4,451,814, Cl. 337-407.000.

Barthe, Marie-Pierre; Battigelli, Jean A.; and Bouquet, Francois. Method and apparatus for glass fiberization. 4,451,276, Cl. 65-6.000.

Bartoszek-Loza, Rosemary, to Standard Oil Company, The. Photoinitiators for decarboxylation reactions. 4,451,343, Cl. 204-158.00R.

BASF Aktiengesellschaft: *See*—
Denzinger, Walter; Goertz, Hans-Helmut; Sanner, Axel; and Hartmann, Heinrich, 4,451,582, Cl. 521-38.000.
Graser, Fritz; and Wickenhaeuser, Gerhard, 4,451,654, Cl. 546-34.000.
Hansen, Hanspeter; Merkle, Hans; and Mueller, Albrecht, 4,451,378, Cl. 210-725.000.
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.
Patsch, Manfred; and Ruske, Manfred, 4,451,398, Cl. 260-154.000.
Wisseroth, Karl, 4,451,088, Cl. 299-11.000.

BASF Farben +Fasern AG: *See*—
Meisner, Roland A., 4,450,785, Cl. 118-626.000.

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Hemmerle, Clayton J.; and Basinger, Richard A., 4,450,884, Cl. 160-371.000.

Basista, Heinrich; and Glatzel, Erhard, to Carl-Zeiss-Stiftung. Photographic lens of continuously variable focal length. 4,451,124, Cl. 350-427.000.

Basrai, Habil S.; and Rajagopal, Ganesh, to Ford Motor Company. Electro-hydraulic proportional actuator. 4,450,753, Cl. 91-35.000.

Batchelor, Gary R.; Russo, Carmen A., Sr.; and Bradley, Martin, to Wheaton Industries. Methods and compositions for producing decorative frosting effects on glass. 4,451,329, Cl. 156-660.000.

Batiuk, Walter. Method of improving the corrosion resistance of chemical conversion coated aluminum. 4,451,304, Cl. 148-6.270.

Battelle Memorial Institute: *See*—
Schneider, Michel; Chevreux, Pierre; and Guillot, Christian, 4,451,568, Cl. 435-181.000.

Batterson, William D.: *See*—
Striese, Jim G.; Iafret, John E.; and Batterson, William D., 4,451,071, Cl. 292-341.180.

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Barthe, Marie-Pierre; Battigelli, Jean A.; and Bouquet, Francois, 4,451,276, Cl. 65-6.000.

Bauer, Carl F.; Hussey, James H.; and Langston, Benny, to American Can Company. Flux in recovery of aluminum in reverberatory furnace. 4,451,287, Cl. 75-24.000.

Bauer, Richard, Jr.: *See*—
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Baugh, John L.; and Montgomery, James W., to Hughes Tool Company. Device for tapping and plugging a fluid conductor. 4,450,857, Cl. 137-318.000.

Baum, William N.: *See*—
Lok, Roger; Freeman, John P.; and Baum, William N., 4,451,557, Cl. 430-505.000.

Baumann, Horst: *See*—
Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, 4,451,261, Cl. 8-94.220.

Baumann, Marcus: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,451,462, Cl. 424-248.550.

Baxter Travenol Laboratories, Inc.: *See*—
Geissler, Ulrich C.; Grode, Gerald A.; Stith, William J.; and Williams, Ronald A., 4,451,259, Cl. 604-408.000.

Bayer Aktiengesellschaft: *See*—
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,451,475, Cl. 424-270.000.
Dickore, Karlfried; and Kuhle, Engelbert, 4,451,406, Cl. 260-465.00D.
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.

Frank, Walter; Bendszus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, 4,451,509, Cl. 427-54.100.
Knops, Hans-Joachim; Babczinski, Peter; Eue, Ludwig; and Schmidt, Robert, 4,451,282, Cl. 71-92.000.
Ostlinning, Edgar; Idel, Karsten; Neuner, Otto; and Bottenbruch, Ludwig, 4,451,644, Cl. 528-388.000.
Reinehr, Ulrich; Herbertz, Toni; and Spilgies, Gunter, 4,451,423, Cl. 264-182.000.

BBC Brown, Boveri & Company, Limited: *See*—
Skala, Karel, 4,451,740, Cl. 290-40.00C.

Beacon Chemical Company, Inc.: *See*—
Kerr, Stuart R., III; and Meshirer, Milton, 4,451,529, Cl. 428-319.300.

Beal, Roy E., to Copper Development Association, Inc. Soldering composition and method of use. 4,451,541, Cl. 428-658.000.

Beale, Robert J.; Bradbury, Allen G. W.; Medcalf, Darrell G.; and Romig, William R., to General Foods Corporation. Sugar beet pulp bulking agent and process. 4,451,489, Cl. 426-254.000.

Beard, Walter C. Viscous flow tilt valve for pressurized container. 4,450,984, Cl. 222-402.220.

Beard, Walter C. Reclosable valve with separate internal seal means and seal removing means therefor. 4,450,985, Cl. 222-402.220.

Beavers, Allan E., to T. A. Pelsue Company. Free-standing collapsible tent frame structure and hub assembly therefor. 4,450,851, Cl. 135-109.000.

Beckenhauer, Robert L., to Memorex Corporation. Method and apparatus for decoding binary data. 4,451,819, Cl. 340-347.0DD.

Beckman Instruments, Inc.: *See*—
Oh, Chan S.; and Kramer, Gordon, 4,451,122, Cl. 350-334.000.

Beckmann, Heinrich; Ottersbach, Jens; Roider, Willibald; and Saumweber, Eckart, to Knorr-Bremse GmbH. Anti-lock device for regulating the brake pressure of vehicle brakes. 4,451,889, Cl. 364-426.000.

Bedenbender, John W.: *See*—
Weber, Richard M.; and Bedenbender, John W., 4,450,928, Cl. 181-121.000.

Bedford, Keith: *See*—
Walker, Stephen E.; Bedford, Keith; and Eaves, Terence, 4,450,877, Cl. 141-1.000.

Bedrosian, Elliot P., to Siecor Corporation. Telephone cable reel. 4,451,013, Cl. 242-118.400.

Beers, David G.: *See*—
Sharpe, Verlos G.; and Beers, David G., 4,450,692, Cl. 62-233.000.

Behrend, Lothar; Knothe, Erich; Melcher, Franz-Josef; and Ober, Jurgen, to Sartorius GmbH. Electronic weighing scale. 4,450,923, Cl. 177-212.000.

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Beinhaur, Ernest F , to AMP Incorporated. Toolless splice sealant device. 4,451,696, Cl. 174-92.000.

Belardinelli, Giorgio: *See*—
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Belden, Reed H.; Li, Hsin L.; and Sawheny, Dulari L., to Allied Corporation. Method of and apparatus for continuous casting using an auxiliary graphite chill roll. 4,450,891, Cl. 164-463.000.

Belinkoff, Irving R.; and Satkunas, Bruno. Rotary cooking device. 4,450,758, Cl. 99-332.000.

Bell, Michael. Boots with quick release means. 4,450,634, Cl. 36-138.000.

Bell Telephone Laboratories, Incorporated: *See*—
Burke, Edmund T.; Gorman, Patrick H., II; Henderson, James A., Jr.; and Smith, Nicholas K., 4,451,705, Cl. 179-27.00D.
Fuls, Ellis N.; Lifshitz, Nadia; and Vaidya, Sheila, 4,450,620, Cl. 29-571.000.
Papathomas, Thomas V.; Scuderi, Rudolph, deceased; White, May S., co-executrix; and D'Ambrose, Camille, co-executrix, 4,451,773, Cl. 320-59.000.
Rucker, Lucien M., III, 4,451,747, Cl. 307-549.000.
Winkelman, Max D., 4,451,704, Cl. 179-18.00F.

Bell, William T., to Schlumberger Technical Corporation. Shaped charge and method of making it. 4,450,768, Cl. 102-307.000.

Bellamy, Robert L., Jr.; Bersot, James D.; Leonard Thomas K.; and Muse, Richard R., to International Business Machines Corporation. Fastening element and a fastener assembly using the same. 4,451,190, Cl. 411-337.000.

Beltone Electronics Corporation: *See*—
Waxman, Ronald, 4,451,709, Cl. 179-107.00S.

Beltz, John P.; and Hang, Kenneth W., to RCA Corporation. Automatic liquid dispensing apparatus for spinning surface of uniform thickness. 4,451,507, Cl. 427-240.000.

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Trop, Moshe; and Livne, Avinoam, 4,451,491, Cl. 426-555.000.

Bend Research, Inc.: *See*—
Roman, Ian C., 4,451,270, Cl. 55-38.000.

Bendig, Mark W., to OCLC Online Computer Library Center, Incorporated. Viewdata system and apparatus. 4,451,701, Cl. 179-2.0TV.

Bendix Corporation, The: *See*—
Vick, Ralph L., 4,450,870, Cl. 138-31.000.

Bendszus, Otto: *See*—
Frank, Walter; Bendszus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, 4,451,509, Cl. 427-54.100.

Bennes Marrel: *See*—
Tardy, Maurice, 4,450,865, Cl. 137-625.600.

Bennett, Everett W.; and Arfaei, Ahmad, to James River Graphics, Inc. Vesicular film and composition with phenoxy resin matrix. 4,451,550, Cl. 430-176.000.

Bensel, James B. Pole type speaker support structure. 4,451,019, Cl. 248-1.000.

Bensley, Douglas W. Footwear. 4,450,632, Cl. 36-17.0PW.

Beppu, Kazuo: *See*—
Kobayashi, Setsuo; Beppu, Kazuo; Shimizu, Hiroshi; Ogawa, Satoshi; and Kotani, Ryotaro, 4,451,569, Cl. 435-188.000.

Berardinelli, Frank M.: *See*—
Cincotta, David E.; and Berardinelli, Frank M., 4,451,611, Cl. 525-51.000.

Berg, Morris, to General Motors Corporation. Pulverizing sputtered deposits to make powdered metal. 4,451,429, Cl. 419-33.000.

Berger, Frank M.; DeGraw, Joseph I., Jr.; and Johnson, Howard L., to Berger, Frank M. T-Butyl-phenoxy-alkylene esters of benzoic and nicotinic acids, compositions containing same and their antihistaminic method of use. 4,451,474, Cl. 424-266.000.

Bergman, Ulf C., to Mechanical Technology Inc. Safety valve. 4,450,859, Cl. 137-516.290.

Bergougnou, Maurice A.: *See*—
Meunier, Georges; and Bergougnou, Maurice A., 4,450,895, Cl. 165-1.000.

Bergstrand, Karl-Gunnar, to Bergstrand, Karl-Gunnar; and Bergstrand Kvalitetskontroll AB. Method and apparatus to detect randomly distributed discontinuities in different directions in a longitudinally moving web using rotating probes in overlapped paths. 4,451,787, Cl. 324-242.000.

Bergstrand Kvalitetskontroll AB: *See*—
Bergstrand, Karl-Gunnar, 4,451,787, Cl. 324-242.000.

Bernstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,451,479, Cl. 424-273.00P.

Bersot, James D.: *See*—
Bellamy, Robert L., Jr.; Bersot, James D.; Leonard Thomas K.; and Muse, Richard R., 4,451,190, Cl. 411-337.000.

Best, Gerd; and Weikert, Norbert B., to Krampe & Co Fertigung in Bergbaubedarf GmbH. Cutting roller. 4,451,092, Cl. 299-81.000.

Bethlehem Steel Corp.: *See*—
Kopnicky, Robert J., 4,450,736, Cl. 81-463.000.
Lamphier, Larry N.; and Meyers, Walter A., 4,451,172, Cl. 405-49.000.
Larson, Duane B.; and Westermeier, Richard J., 4,450,702, Cl. 72-250.000.

Bett, John A. S.: *See*—
Setzer, Herbert J.; Bett, John A. S.; and Lesieur, Roger R., 4,451,578, Cl. 502-303.000.

Bevan, William G.: *See*—
Ostroff, Stuart S.; and Bevan, William G., 4,451,791, Cl. 324-434.000.

Beverskog, Sven: *See*—
Jakobsson, Per-Olof; and Beverskog, Sven, 4,450,899, Cl. 165-39.000.

BFG Glassgroup: *See*—
Nolte, Hans-Henning, 4,451,312, Cl. 156-99.000.

Bianchi, Edward A., to AMP Incorporated. Method and tool for preparing coaxial cable and for positioning coaxial connector therewith. 4,450,621, Cl. 29-828.000.

BICC Public Limited Company: *See*—
Verne, Stefan, 4,451,306, Cl. 156-51.000.

Biermann, Manfred: *See*—
Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, 4,451,261, Cl. 8-94.220.

Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, to Stanley Works, The. Display bracket for socket drive units and package employing same. 4,450,961, Cl. 206-349.000.

Billot, Michel: *See*—
Kemler, Marc; Coppens, Christian; and Billot, Michel, 4,451,708, Cl. 179-98.000.

Birkelbach, Donald F.: *See*—
Shipley, Randall S.; and Birkelbach, Donald F., 4,451,626, Cl. 526-122.000.

Birman, Anatoly S.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

Bishop, James S.: *See*—
Sawada, Fred H.; Bishop, James S.; and Blaize, Llewellyn A., 4,451,786, Cl. 324-158.0MG.

Black Clawson Company, The: *See*—
Chupka, David E., 4,451,358, Cl. 209-144.000.
Phelps, Richard W., 4,450,630, Cl. 34-116.000.

Black & Decker Inc.: *See*—
Dynie, Ernest R., 4,450,672, Cl. 56-16.700.

Black, Denny E.; Garrett, David W.; and Coakley, Thomas A., to Owens-Corning Fiberglas Corporation. Resin modification for glass fiber adherence. 4,451,592, Cl. 523-206.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Glass-filled polyarylene sulfide compositions containing organosilanes. 4,451,601, Cl. 524-263.000.

Blaize, Llewellyn A.: *See*—
Sawada, Fred H.; Bishop, James S.; and Blaize, Llewellyn A., 4,451,786, Cl. 324-158.0MG.

Bliss & Laughlin Industries, Inc.: *See*—
Mower, Morris F.; and Johnson, Eugene R., 4,451,223, Cl. 425-458.000.

Bliven, David L., to Dresser Industries, Inc. Apparatus for sealing between a shaft and housing with multiple land members and seal members. 4,451,046, Cl. 277-3.000.

Blount, David H. Process for the production of alkali metal polyester silicate resinous products. 4,451,638, Cl. 528-205.000.

Blue Giant Equipment of Canada Ltd.: *See*—
Larsen, Kurt K., 4,450,598, Cl. 14-71.100.

Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Photo deposition of metals with far UV radiation. 4,451,503, Cl. 427-53.100.

Blumer, Kurt: *See*—
Bullis, Douglas E.; and Blumer, Kurt, 4,450,641, Cl. 42-6.000.

Bocci, Giorgio; Dardano, Alberto; Levaggi, Vittorio; and Milani, Ambrogio, to Italimpianti Societa Impianti p.A. Radiant flat flame burner. 4,451,230, Cl. 431-284.000.

Bocker, Dietrich: *See*—
Wolfrum, Erhard; Erken, Manfred; and Bocker, Dietrich, 4,450,777, Cl. 110-342.000.

Boeckmann, Eduard F. B., to GTE Automatic Electric Inc. Telephone substation transmitter muting circuit. 4,451,706, Cl. 179-81.00R.

Boehm, Peter, to ITT Industries, Inc. Brake booster for automotive vehicles. 4,450,688, Cl. 60-554.000.

Boehringer Mannheim GmbH.: *See*—
Vetter, Hellmuth; Scheibe, Peter; Thum, Waldemar; and Naher, Gotthilf, 4,451,487, Cl. 435-183.000.

Boeing Company, The: *See*—
Hapke, Donald W., 4,451,015, Cl. 244-15.000.
Whitener, Philip C., 4,450,661, Cl. 52-206.000.

Boettcher, William C.; Volkmer, Richard B.; and Wehde, Wayne R., to D.O.V.E. Equipment Corporation. Portion control liquid dispenser. 4,450,987, Cl. 222-641.000.

Boettner, Fred H.; Cutler, John H.; and Walker, Loren H., to General Electric Company. Method and apparatus for determining the resistance of an AC motor stator. 4,451,770, Cl. 318-757.000.

Boev, Kiril K.: *See*—
Petrov, Georgi M.; Boev, Kiril K.; Fidelski, Igor A.; and Pirgov, Yordan T., 4,450,675, Cl. 57-6.000.

Bogar, Earl M., Jr. Gun rack for motor vehicles. 4,450,989, Cl. 224-42.45R.

Boisvert, Pierre U.; and Bapst, Jean-Daniel, to Barcana Ltee. Automatic artificial tree. 4,451,510, Cl. 428-8.000.

Bolstad, James J. Backpack frame convertible to a chair and conversion assembly therefor. 4,450,990, Cl. 224-155.000.

Bolto, Brian A.; and Jackson, Mervyn B., to ICI Australia Ltd.; and Commonwealth Scientific and Industrial Research Organization. Ion exchange resin. 4,451,581, Cl. 521-28.000.

Boone, Luc: *See*—
Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, 4,451,336, Cl. 204-47.000.

Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,451,244, Cl. 464-68.000.

Bornstein, Norman S.: *See*—
Smeggil, John G.; Bornstein, Norman S.; and Brown, Clyde O., 4,451,299, Cl. 148-1.000.

Borzone, Rocco R.: *See*—
Asnis, Stanley E.; and Borzone, Rocco R., 4,450,835, Cl. 128-92.0EB.

Bos, Johannes G. G.; Pollaert, Hendricus J. P. M.; and Sijben, Johannes L. H. Back rotation device for a cable stranding machine. 4,450,674, Cl. 57-6.000.

Bosca, Bernard: *See*—
Maurel, Pierre; Bosca, Bernard; and Nicolas, Francois, 4,451,439, Cl. 423-55.000.

Bosne, Jacques G. P. E., to Hamon-Sobelco, S.A. Heat exchanger in particular for an atmospheric cooling tower. 4,450,902, Cl. 165-82.000.

Botar, Sandor: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Bottenbruch, Ludwig: *See*—
Ostlinning, Edgar; Idel, Karsten; Neuner, Otto; and Bottenbruch, Ludwig, 4,451,644, Cl. 528-388.000.

Bounds, Charles T., to Dow Chemical Company, The. Preparation of alkylidenebis(dibromophenol). 4,451,675, Cl. 568-726.000.

Bouquet, Francois: *See*—
Barthe, Marie-Pierre; Battigelli, Jean A.; and Bouquet, Francois, 4,451,276, Cl. 65-6.000.

Bourson, Lucien; Delavarenne, Serge; and Tellier, Pierre, to PCUK Produits Chimiques Ugine Kuhlmann. Process for cooking lignocellulosic materials intended for the production of paper pulp with 1,2,3,4-tetrahydro-9,10-anthracenediol. 4,451,333, Cl. 162-77.000.

Bouteille, Daniel. Compressed gas saving device. 4,450,861, Cl. 137-553.000.

Bower, Arnold B., Jr., to Hughes Tool Company. Method and apparatus for affixing a roof bolting plate to a mine roof. 4,451,179, Cl. 405-260.000.

Boyarunas, Albert M.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Bozzelli, John C.: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; Newton, Kevin H.; and Bozzelli, John C., 4,450,978, Cl. 221-13.000.

Bradbury, Allen G. W.: *See*—
Beale, Robert J.; Bradbury, Allen G. W.; Medcalf, Darrell G.; and Romig, William R., 4,451,489, Cl. 426-254.000.

Brader, Walter H., Jr.: *See*—
Knifton, John F.; Lin, Jiang-Jen; Grigsby, Robert A., Jr.; and Brader, Walter H., Jr., 4,451,679, Cl. 568-909.000.

Bradley, Martin: *See*—
Batchelor, Gary R.; Russo, Carmen A., Sr.; and Bradley, Martin, 4,451,329, Cl. 156-660.000.

Bradley, Michael W.; Hiles, Andrew G.; and Kippax, John W., to Davy McKee (London) Limited. Multistage aldehyde hydrogenation. 4,451,677, Cl. 568-881.000.

Braiko, Voldmir V.: *See*—
Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.

Branchadell, Jose , to SOLVAY & Cie. Process for blow-molding a hollow article from a preform made from a thermoplastic. 4,451,426, Cl. 264-535.000.

Brand, Johannes, to Akzo NV. Preparation of isocyanuric esters. 4,451,651, Cl. 544-221.000.

Braunitzer, Gerhard: *See*—
Vertesy, Laszlo; Mracek, Miroslav; Braunitzer, Gerhard; and Aschauer, Heinz, 4,451,455, Cl. 424-177.000.

Bravenec, Frank R., to Halliburton Company. Spontaneous potential log apparatus with randomly occurring noise cancellation. 4,451,790, Cl. 324-351.000.

Breitenstein, Werner: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,451,462, Cl. 424-248.550.

Brendle, David A. Merchandise display device. 4,450,775, Cl. 108-64.000.

Bricker, Harry C., Jr.; Gutter, David H.; and Stull, Robert S., to AMP Incorporated. Electrical connector having commoning member. 4,451,099, Cl. 339-14.00R.

Briens, Cedric L.; Sankey, Bruce M.; and Ewener, Patrick C., to Exxon Research and Engineering Co. Solvent dewaxing waxy hydrocarbon distillates using a combination poly acrylate polymer and polymethacrylate polymer dewaxing aid. 4,451,353, Cl. 208-33.000.

Briggs, Douglas V. Feed tub. 4,450,791, Cl. 119-61.000.

Briggs, Willard S.: *See*—
Gerson, Isadore S.; and Briggs, Willard S., 4,451,885, Cl. 364-200.000.

Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., to Stromberg-Carlson Corporation. Arrangement of interactive telephone switching processors for performing timing analyses of port events. 4,451,702, Cl. 179-18.0ES.

Brightman, Barrie; and Niertit, Frank, to Stromberg-Carlson Corporation. All electronic interface for telephony system. 4,451,703, Cl. 179-18.0FA.

Bristol-Myers Company: *See*—
Kaplan, Murray A.; and Granatek, Alphonse P., 4,451,447, Cl. 424-131.000.
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, 4,451,456, Cl. 424-177.000.

British Aluminium Company Limited, The: *See*—
Wilkins, Rennie F. T., 4,450,887, Cl. 164-154.000.

British Nuclear Fuels Limited: *See*—
Watson, Eric; and Hunter, Eric, 4,451,173, Cl. 405-53.000.

BroadCom, Inc.: *See*—
Gruenberg, Elliot L., 4,451,699, Cl. 179-2.0EB.

Brogardh, Torgny; Engstrom, Olof; and Ovren, Christer, to ASEA Aktiebolag. Optical measuring apparatus for measuring force or pressure. 4,451,730, Cl. 250-227.000.

Brooks, William R.; and Heinzel, Irving C. Method of dimensioning a polyurethane foam bandage. 4,450,833, Cl. 128-90.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Ishikawa, Michio; and Sasaki, Kiyoshi, 4,451,187, Cl. 409-187.000.

Broughton, Ralph W. Theft prevention step ladder. 4,450,937, Cl. 182-206.000.

Broussard, Baron T. Slip elevator. 4,450,606, Cl. 188-67.000.

Brousseau, Jean-Francoys: *See*—
Pomerleau, Andre; and Brousseau, Jean-Francoys, 4,451,896, Cl. 364-569.000.

Brouwer, Charles W.; and Cowan, Larry C., to Leesona Corporation. Yarn clamp. 4,450,874, Cl. 139-429.000.

Brower, George H. Electronic control for an automobile air conditioner. 4,451,741, Cl. 307-10.00R.

Brown, Clyde O.: *See*—
Smeggil, John G.; Bornstein, Norman S.; and Brown, Clyde O., 4,451,299, Cl. 148-1.000.

Brown, Harry J., to Union Carbide Corporation. Hard facing of metal substrates using material containing VC and improved flux compositions therefor. 4,451,508, Cl. 427-423.000.

Brown, James Howard: *See*—
DeVillez, Richard L., 4,451,480, Cl. 424-278.000.

Brown, Karen H.: *See*—
Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, 4,451,503, Cl. 427-53.100.

Brown, Wade R., to Eaton Corporation. Series connected solenoid appliance control valve assembly. 4,450,863, Cl. 137-613.000.

Brownlee Labs Inc.: *See*—
Brownlee, Robert; and Higgins, Jeremy W., 4,451,363, Cl. 210-198.200.
Higgins, Jeremy W.; and Brownlee, Robert, 4,451,364, Cl. 210-198.200.

Brownlee, Robert; and Higgins, Jeremy W., to Brownlee Labs Inc. Cartridge for liquid chromatograph. 4,451,363, Cl. 210-198.200.

Brownlee, Robert: *See*—
Higgins, Jeremy W.; and Brownlee, Robert, 4,451,364, Cl. 210-198.200.

Brownscombe, Thomas F.; and Willis, Carl L., to Shell Oil Company. Olefin polymerization. 4,451,633, Cl. 526-348.600.

Bruhnke, Ulrich; Christoph, Bernd; Harloff, Bernd; and Krakat, Hans, to Daimler-Benz Aktiengesellschaft. Structurally reinforced motor vehicle bodies. 4,451,077, Cl. 296-185.000.

Brunner, Karlheinz: *See*—
Ostkamp, Willi; Brunner, Karlheinz; and Wibbelt, Friedrich, 4,451,247, Cl. 494-52.000.

Brunnmueller, Fritz: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.

Brunswick Corporation: *See*—
Puryear, John W.; and Callan, Arthur D., 4,451,012, Cl. 242-84.20A.

Bryan, George D., Jr.: *See*—
Robertson, Field L., Jr.; and Bryan, George D., Jr., 4,450,700, Cl. 72-115.000.

Bubenzer, Wilfried, to Robert Bosch GmbH. Sealing jaw for forming seams in heat-sealable packaging materials. 4,451,325, Cl. 156-583.100.

Buchel, Karl H.: *See*—
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.

Buckner, John G.; Lineberry, Cletus E.; and Harris, Jimmy W., to Auto-Systems & Service, Inc. Method and apparatus for transferring slugs from a conveyor to a slug cutting device. 4,450,739, Cl. 83-23.000.

Budden, Renke: *See*—
Hachmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Budden, Renke, 4,451,468, Cl. 424-256.000.

Buechler, Lester W., to Ohio Electronic Engravers, Inc. Engraving and scanning apparatus. 4,451,856, Cl. 358-299.000.

Buerman, Marc H. L.: *See*—
Taylor, Michael G. C.; and Buerman, Marc H. L., 4,451,710, Cl. 179-110.00A.

Buhlmann, Hans; and Welzel, Dieter, to Sandoz Ltd. Method for the treatment of post-operative thrombosis. 4,451,458, Cl. 424-183.000.

Bujan, Albert F.; and Harms, Jack L., to Abbott Laboratories. Dual flow rate intravenous administration set with single pump chamber. 4,451,255, Cl. 604-157.000.

Bullis, Douglas E.; and Blumer, Kurt, to Remington Arms Company, Inc. Magazine floor plate latch for bolt action rifles. 4,450,641, Cl. 42-6.000.

Bunnell Plastics, Inc.: *See*—
Gamble, James E., 4,450,631, Cl. 34-110.000.

Burckhardt, Christoph: *See*—
Thoma, Frank; Hoffmann, Karl-Heinz; and Burckhardt, Christoph, 4,450,818, Cl. 123-502.000.

Buresh, Lloyd V.; Hammond, Garth D.; Koval, Emil J.; and McCormick, Vernon R., to Rockwell International Corporation. Connector assembly. 4,451,103, Cl. 339-93.00R.

Burger, Joe R.: *See*—
Alexander, William H.; and Burger, Joe R., 4,450,854, Cl. 137-246.120.

Burke, Edmund T.; Gorman, Patrick H., II; Henderson, James A., Jr.; and Smith, Nicholas K., to Bell Telephone Laboratories, Incorporated. Call completion circuit and method. 4,451,705, Cl. 179-27.00D.

Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., to International Business Machines Corp. Method of making edge protected ferrite core. 4,451,344, Cl. 204-192.00R.

Burndy Corporation: *See*—
Collier, John C., 4,450,624, Cl. 29-881.000.

Burnett, David B.: *See*—
Allen, Joseph C.; Gillespie, Robert E.; and Burnett, David B., 4,450,913, Cl. 166-303.000.

Burney, Ivan T.: *See*—
Crookston, Ronald W.; and Burney, Ivan T., 4,451,717, Cl. 200-82.00B.

Burr, Robert P., to Kollmorgen Technologies Corporation. Process for the manufacture of circuit boards. 4,450,623, Cl. 29-850.000.

Burroughs Corp.: *See*—
Alper, Daniel D., 4,451,027, Cl. 271-10.000.
Kay, Nicholas W., 4,451,761, Cl. 313-586.000.
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,914, Cl. 369-109.000.
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,915, Cl. 369-109.000.

Burton, Willie T., Jr.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Bartscher, Paul, to Zurcher Kantonalbank. Method of producing a composite foamed resin torso and head section of a human summary for medical training purposes. 4,451,416, Cl. 264-46.600.

Buschmann, Gerd: *See*—
Hachmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Budden, Renke, 4,451,468, Cl. 424-256.000.

Buschor, Josef J.; Long, James C.; and Schmidt, Dieter K., to Five X Corporation. Machine for transporting and stacking loaded cartons. 4,450,949, Cl. 198-422.000.

Buske, Gary R.; and Pews, Richard G., to Dow Chemical Company, The. Process of preparing sulfonium organosulfonates. 4,451,408, Cl. 260-505.00R.

Buske, Gary R.; and Pews, Richard G., to Dow Chemical Company, The. Sulfonium organosulfonates. 4,451,409, Cl. 260-513.00R.

Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, to Bayer Aktiengesellschaft. Cyclic sulphenamide compounds, their production and their medicinal use. 4,451,475, Cl. 424-270.000.

Butler, Graham; and Wright, Christopher J., to United Kingdom Atomic Energy Authority. Method of preparing a supported catalyst. 4,451,580, Cl. 502-335.000.

Butt, Alan G., to Trane Company, The. Plate type heat exchanger with transverse hollow slotted bar. 4,450,903, Cl. 165-110.000.

Buttner, Kurt, to Okoma Maschinenfabrik GmbH. Roller table for woodworking machines. 4,450,881, Cl. 144-84.000.

Bye, Donald J.; Stanistreet, Harold P.; and Lindenstruth, Werner, to Imperial Chemical Industries, PLC. Apparatus and process for the production of pile surface articles. 4,451,419, Cl. 264-164.000.

Cagen, Stuart Z., to Shell Oil Company. Method of preventing or ameliorating pyrethroid skin sensory stimulation. 4,451,482, Cl. 424-284.000.

Cahen, Raymond M.: *See*—
De Clippeleir, Georges E. M. J.; Cahen, Raymond M.; and Martins Mendes Cerejo, Francisco A., 4,451,686, Cl. 585-444.000.

Calas, Patrick; Moreau, Patrice; and Commeyras, Auguste, to PCUK Produits Chimiques Ugine Kuhlmann. Process for the preparation of true acetylene hydrocarbons having a perfluorinated chain. 4,451,682, Cl. 570-142.000.

California Interface and Software Limited Partnership: *See*—
Hall, John S.; and Phelps, Barry C., 4,451,068, Cl. 283-75.000.

Callan, Arthur D.: *See*—
Puryear, John W.; and Callan, Arthur D., 4,451,012, Cl. 242-84.20A.

Callihan, Rudy B.; and Stone, Lyndon R., to Baker Oil Tools, Inc. Method and apparatus for well cementing through a tubular member. 4,450,912, Cl. 166-289.000.

Cameron, John R., to Wisconsin Alumni Research Foundation. Method and apparatus for measuring air ion concentrations. 4,451,736, Cl. 250-376.000.

Campbell, Leslie E., to Owens-Corning Fiberglas Corporation. Film former emulsification. 4,451,594, Cl. 523-336.000.

Campbell, Richard W., to General Electric Company. Copolymeric nucleating agent for polyester. 4,451,606, Cl. 524-445.000.

Canadian General Electric Company Limited: *See*—
Lonseth, Palmer; Selkirk, Neil R.; and Moorby, Donald G., 4,451,870, Cl. 361-433.000.

Canadian Patents & Development Limited: *See*—
Tweddle, Thomas A.; Thayer, William L.; Kutowy, Oleh; and Sourirajan, Srinivasa, 4,451,424, Cl. 264-216.000.

Canfield, Henry A. Removable storage cover for truck beds. 4,451,075, Cl. 296-37.600.

Cannon, Fleming V., Jr.; and Casteel, Frankie E., to Dover Corporation. Wheel lift apparatus. 4,451,193, Cl. 414-563.000.

Canon Kabushiki Kaisha: *See*—
Fushimoto, Hideo, 4,451,121, Cl. 350-331.00R.
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,451,547, Cl. 430-128.000.
Ikari, Hideo; and Hirohata, Michio, 4,451,129, Cl. 354-477.000.
Shimizu, Seiichi, 4,451,131, Cl. 354-286.000.
Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, 4,451,136, Cl. 355-14.0SH.

Capote, Miguel A.: *See*—
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,914, Cl. 369-109.000.
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,915, Cl. 369-109.000.

Caray, Andre , to VALEO. Diaphragm clutch cover assembly. 4,450,945, Cl. 192-89.00B.

Carl Freudenberg, Firma: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,451,314, Cl. 156-148.000.
Miyazaki, Tadashi; and Hasegawa, Takao, 4,451,311, Cl. 156-86.000.
Miyazaki, Tadashi, 4,451,315, Cl. 156-220.000.
Tecl, Bohuslav; Fahrbach, Erich; Knoke, Jurgen; and Assent, Hans C., 4,451,520, Cl. 428-198.000.

Carl Schmale KG: *See*—
Freermann, Johannes, 4,450,780, Cl. 112-147.000.

Carl-Zeiss-Stiftung: *See*—
Basista, Heinrich; and Glatzel, Erhard, 4,451,124, Cl. 350-427.000.

Carlson, John H.: *See*—
Farley, Wilbur H.; Kotek, Alfred J.; and Carlson, John H., 4,451,098, Cl. 308-201.000.

Carmien, Joseph A. Flexible core for tool handles. 4,451,073, Cl. 294-57.000.

Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, to Harris Corporation. Repeatered, multi-channel fiber optic communication network having fault isolation system. 4,451,916, Cl. 370-16.000.

Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, 4,451,631, Cl. 526-287.000.
Piesch, Steffen; and Dorries, Peter, 4,451,620, Cl. 525-398.000.

Casteel, Frankie E.: *See*—
Cannon, Fleming V., Jr.; and Casteel, Frankie E., 4,451,193, Cl. 414-563.000.

Castro, Robert J. Archery rack. 4,450,967, Cl. 211-13.000.

Casull, Richard J. Belt buckle-mini-revolver combination. 4,450,992, Cl. 224-163.000.

Catan, Robert S., to Dynaforce Corporation. Air blower arrangement for producing air screen and related method. 4,450,755, Cl. 98-36.000.

Caterpillar Tractor Co.: *See*—
Morris, Hugh C., 4,450,941, Cl. 192-3.310.
Vidal-Meza, Gonzalo D., 4,450,705, Cl. 72-379.000.

Cauldwell, Jack D., to Purity Packaging Corporation. Apparatus and process for aligning a plate and mounting it on a print cylinder. 4,451,309, Cl. 156-64.000.

Celanese Corporation: *See*—
Cincotta, David E.; and Berardinelli, Frank M., 4,451,611, Cl. 525-51.000.
Dammann, Laurence G., 4,451,628, Cl. 526-225.000.

Centralen Mashinostroitelen Institute: *See*—
Makedonski, Boris G.; and Atanassov, Haralampi A., 4,451,269, Cl. 51-303.000.

Centre Technique du Cuir: *See*—
Huc, Alain R.; Allard, Roland L.; and Chavrier, Christian L., 4,451,397, Cl. 260-123.700.

Century Electric, Inc.: *See*—
Phillips, Graham R.; and Prudot, Norvell G., 4,451,775, Cl. 322-10.000.

Cerberus AG: *See*—
Avery, Ronald G.; and Kahl, William G., Jr., 4,451,733, Cl. 250-342.000.
St. Jean, Herbert N.; and Settanni, Richard, 4,451,734, Cl. 250-342.000.

Cerceo, Chris A.; Kaufman, Jeanie F.; and Kaufman, Martin H. Dental physio-tape. 4,450,849, Cl. 132-89.000.

Champion International Corporation: *See*—
Webinger, George P., 4,451,001, Cl. 229-40.000.

Champion Spark Plug Italiana, S.p.A.: *See*—
Maiocco, Guiseppe A., 4,450,602, Cl. 15-250.320.

Chao, Shiuh: *See*—
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,914, Cl. 369-109.000.
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,915, Cl. 369-109.000.

Chapman, Ronald H.; and Peterson, Andrew F., to Motorola Inc. Phase-locked receiver with derived reference frequency. 4,451,930, Cl. 455-260.000.

Chapman, William A., Jr.; and Crowley, John J., to Westvaco Corporation. Rotary envelope cutting apparatus. 4,450,740, Cl. 83-303.000.

Charhut, Frank J., to Chicago-Allis Mfg. Corp. Face seal. 4,451,049, Cl. 277-42.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Magee, Robert J., 4,451,148, Cl. 356-138.000.

Charnock, Ronald S., to Loctite (Ireland) Limited. Polyisoprene toughened adhesive composition. 4,451,615, Cl. 525-98.000.

Chavrier, Christian L.: *See*—
Huc, Alain R.; Allard, Roland L.; and Chavrier, Christian L., 4,451,397, Cl. 260-123.700.

Chemische Werke Huels, AG: *See*—
Flatau, Karsten, 4,451,614, Cl. 525-80.000.
Mueller, Dieter J., 4,451,301, Cl. 148-6.15R.

Chen, Catherine S. H., to Mobil Oil Corporation. Water soluble phenolic-formaldehyde polymer which is a surfactant mobility control agent in oil recovery. 4,451,623, Cl. 525-505.000.

Chen, Yung J.: *See*—
McNeill, William H.; and Chen, Yung J., 4,451,123, Cl. 350-386.000.

Cheney, Richard F.; Bansal, Anil; and Kimmel, Edward R. Method for determining the size of metal carbide grains in cemented carbides. 4,450,724, Cl. 73-432.00R.

Cheng, Bo-Ching; and Adamson, Ronald B., to General Electric Company. Method for controlled hydrogen charging of metals. 4,451,445, Cl. 423-645.000.

Cheng, Chen-Yen; and Cheng, Sing-Wang. Distillative freezing process for separating volatile mixtures and apparatuses for use therein. 4,451,273, Cl. 62-12.000.

Cheng, John T. C.; and Langsam, Michael, to Air Products and Chemicals, Inc. Reduction of wall fouling in the suspension polymerization of vinyl chloride homopolymer. 4,451,625, Cl. 526-62.000.

Cheng, Sing-Wang: *See*—
Cheng, Chen-Yen; and Cheng, Sing-Wang, 4,451,273, Cl. 62-12.000.

Chesler, Edwin T., to Olin Corporation. Recycling of flexible polyurethane foam scrap. 4,451,583, Cl. 521-49.500.

Chevreux, Pierre: *See*—
Schneider, Michel; Chevreux, Pierre; and Guillot, Christian, 4,451,568, Cl. 435-181.000.

Chevron Research Company: *See*—
Fraas, Lewis M., 4,451,691, Cl. 136-249.000.
Jessel, Alfred J., 4,450,798, Cl. 123-41.410.
Mitchell, David S., 4,451,184, Cl. 406-105.000.
Pasky, Joseph Z., 4,451,684, Cl. 585-329.000.
Pasky, Joseph Z., 4,451,689, Cl. 585-525.000.

Chicago-Allis Mfg. Corp.: *See*—
Charhut, Frank J., 4,451,049, Cl. 277-42.000.

Chicherin, Jury E.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.

Chichester, Willard L.; and Davis, Dean E., to Clark Equipment Company. Auxiliary release device for a hydraulic pressure releasable brake. 4,451,095, Cl. 303-71.000.

Childers, John T., to Henkel Corporation. Sewing thread lubricants. 4,451,382, Cl. 252-8.600.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Christ, Richard; and Kroll, Hartmut. Container for radioactive materials. 4,451,739, Cl. 250-506.100.

Christoph, Bernd: *See*—
Bruhnke, Ulrich; Christoph, Bernd; Harloff, Bernd; and Krakat, Hans, 4,451,077, Cl. 296-185.000.

Chumachenko, Boris A.: *See*—
Erasov, Fedor N.; Chumachenko, Boris A.; and Potaichuk, Vladimir M., 4,451,216, Cl. 418-61.00B.

Chupka, David E., to Black Clawson Company, The. Noncircular rejects outlet for cyclone separator. 4,451,358, Cl. 209-144.000.

Ciba-Geigy Corporation: *See*—
Ferrini, Pier G.; and Goschke, Richard, 4,451,471, Cl. 424-263.000.
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,451,284, Cl. 71-94.000.
Martin, Henry, 4,451,286, Cl. 71-107.000.
Mayer, Fritz; and Holtermann, Svein, 4,451,262, Cl. 8-125.000.
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,451,279, Cl. 71-93.000.
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,451,462, Cl. 424-248.550.

Cincotta, David E.; and Berardinelli, Frank M., to Celanese Corporation. Process for forming blend of polyalkylene terephthalate and wholly aromatic polyester which exhibits an anisotropic melt phase. 4,451,611, Cl. 525-51.000.

Cinquin, Jean-Pierre; Danthony, Jacques; and Mulertt, Charles. Metal structure grounding safety system. 4,451,866, Cl. 361-56.000.

Ciocca, Joseph A.; and Knowles, Gregory W., to Grumman Allied Industries, Inc. Multi-effect rotary distillation process. 4,451,334, Cl. 203-11.000.

Citizen Watch Co., Ltd.: *See*—
Hashimoto, Eigo; and Nanya, Takanori, 4,451,498, Cl. 427-38.000.
Suzuki, Fuminori; and Ichikawa, Singo, 4,451,743, Cl. 307-110.000.

Clabby, Merlyn L., deceased; and Sheppard, Patrick J., executor. Disposable razor dispenser. 4,450,980, Cl. 221-281.000.

Clark Equipment Company: *See*—
Chichester, Willard L.; and Davis, Dean E., 4,451,095, Cl. 303-71.000.

Clark, James M.; and Small, Tony M., to Halliburton Company. Cleaning system for packer removal. 4,450,907, Cl. 166-223.000.

Clark, Kenneth F.: *See*—
Tavss, Edward A.; Eigen, Edward; and Clark, Kenneth F., 4,451,385, Cl. 252-132.000.

Clark, Robert W., Jr. Thermally powered, gravitationally assisted heat transfer systems. 4,450,690, Cl. 62-116.000.

Classens, Adrianus M. M.; Aalbertsberg, Frederik W.; and Van Marle, Hendrika G., to U.S. Philips Corporation. Method of manufacturing a longitudinally watertight cable and longitudinally watertight cable thus obtained. 4,451,692, Cl. 174-23.00C.

Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, to Compagnie Francaise de Raffinage. Multilayer composite material, especially for closures for plastic containers. 4,451,526, Cl. 428-216.000.

Claude, Jean, to Technigaz. Method of and device for remotely detecting leaks in a fluid-conveying pipe-line submerged within an ambient fluid and pipe-line provided with such a detection device. 4,450,711, Cl. 73-40.50R.

Clausen, Victor H.; and Asbury, Charles E., to H. B. Fuller Company. Network reinforcing forming apparatus and method. 4,451,515, Cl. 428-112.000.

Clayburn Refractories, Inc.: *See*—
Trumbull, James L.; and Gillam, William A., 4,450,666, Cl. 52-749.000.

Clear, Elmer E., to Phillips Petroleum Company. Aqueous gels. 4,451,389, Cl. 252-315.300.

Clendenin, Joseph G. Passive diversionary fluid collecting and debris separating apparatus. 4,450,654, Cl. 52-12.000.

Coachmen Industries, Inc.: *See*—
Snyder, Steven A., 4,451,063, Cl. 280-163.000.

Coakley, Thomas A.: *See*—
Black, Denny E.; Garrett, David W.; and Coakley, Thomas A., 4,451,592, Cl. 523-206.000.

Cobe Laboratories, Inc.: *See*—
Elgas, Roger J.; and Gordon, Timothy M., 4,451,562, Cl. 435-2.000.

Cochran, William C.: *See—*
Prescott, Ernest; and Cochran, William C., 4,451,302, Cl. 148-13.100.

Cody, Ian A., to Exxon Research and Engineering Co. Production of surface modified zeolites for shape selective catalysis. 4,451,572, Cl. 502-62.000.

Cohen, Gordon S., to Jeneric Industries, Inc. Dental capsule. 4,450,957, Cl. 206-220.000.

Cohen, Marvin C. Rectal hygiene system. 4,450,596, Cl. 4-447.000.

Colburn, Lyle W.; Potter, Craig W.; and Romesberg, Floyd E., to Dow Chemical Company, The. Manufacture of draw-redraw cans using film laminated or extrusion coated steel sheet material. 4,450,977, Cl. 220-458.000.

Colby, Dwight D.: *See—*
Dougherty, William R.; Colby, Dwight D.; Fahley, Jerome A.; and Van Dyke, Martin J., 4,451,894, Cl. 364-509.000.

Cole, Albert, to Thermoforce Limited. Temperature responsive actuating device. 4,450,687, Cl. 60-530.000.

Colgate-Palmolive Company: *See—*
Joshi, David P., 4,451,386, Cl. 252-135.000.
Tavss, Edward A.; Eigen, Edward; and Clark, Kenneth F., 4,451,385, Cl. 252-132.000.

Colgate Research & Development Co.: *See—*
Colgate, Stirling A., 4,451,201, Cl. 415-181.000.

Colgate, Stirling A., to Colgate Research & Development Co. Gas turbine. 4,451,201, Cl. 415-181.000.

Collier, John C., to Burndy Corporation. Method of forming electrical connectors. 4,450,624, Cl. 29-881.000.

Collins, Edmond R. Hitch assembly. 4,451,066, Cl. 280-508.000.

Collister, Jon E., to Premix, Inc. Preparation of curable solid polyester resin pellets and powders. 4,451,610, Cl. 525-19.000.

Combustion Engineering, Inc.: *See—*
Ross, Malcolm F.; and Visner, Sidney, 4,451,427, Cl. 376-267.000.

Commeyras, Auguste: *See—*
Calas, Patrick; Moreau, Patrice; and Commeyras, Auguste, 4,451,682, Cl. 570-142.000.

Commissariat a l'Energie Atomique: *See—*
Gerard, Philippe; Jouve, Hubert; and Madore, Michel, 4,451,500, Cl. 427-38.000.
Levos, Christian; Perie, Daniel; and Gex, Jean-Francois, 4,450,730, Cl. 73-864.610.

Commonwealth of Australia, The: *See—*
Lucas, James G.; Young, Alan C.; and Hinds, Paul M., 4,451,830, Cl. 343-768.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Bolto, Brian A.; and Jackson, Mervyn B., 4,451,581, Cl. 521-28.000.

Communication Systems, Inc.: *See—*
Wiseheart, Ronald W.; and Meyer, Daniel, 4,451,106, Cl. 339-123.000.

Compagnie Francaise de Raffinage: *See—*
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,451,526, Cl. 428-216.000.

Compagnie Francaise d'Emballages et de Conditionnement - CO-FREC: *See—*
Paillet, Bernard, 4,450,965, Cl. 206-528.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Kemler, Marc; Coppens, Christian; and Billot, Michel, 4,451,708, Cl. 179-98.000.

Concast, A.G.: *See—*
Heinemann, Wilfried; and Rummel, Theodor, 4,450,892, Cl. 164-467.000.

Connelly, Kathleen G., to United States of America, Puerto Rico. Convertible shoe. 4,450,633, Cl. 36-101.000.

Conoco Inc.: *See—*
Goldsmith, Riley G., 4,451,177, Cl. 405-195.000.

Contracap, Inc.: *See—*
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,450,836, Cl. 128-127.000.

Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., to Quaker Oats Company, The. Food bar. 4,451,488, Cl. 426-89.000.

Coomber, Barry A.: *See—*
Phillipps, Gordon H.; Humber, David C.; Ewan, David B.; and Coomber, Barry A., 4,451,405, Cl. 260-397.100.

Coope, Robert L., to Stevens Engineering, Inc. Clamping device. 4,451,026, Cl. 269-24.000.

Cooper, Lance A.: *See—*
Jeffrey, Gaines C.; Cooper, Lance A.; and Whipple, Sharon S., 4,451,442, Cl. 423-224.000.

Copeland Corporation: *See—*
Francis, Woodie R.; and Fogt, James F., 4,450,860, Cl. 137-543.190.

Coppens, Christian: *See—*
Kemler, Marc; Coppens, Christian; and Billot, Michel, 4,451,708, Cl. 179-98.000.

Copper Development Association, Inc.: *See—*
Beal, Roy E., 4,451,541, Cl. 428-658.000.

Cordis Corporation: *See—*
Zick, Gregory L.; and Saulson, Stanley H., 4,450,842, Cl. 128-635.000.

Corey, John A., to Mechanical Technology Incorporated. Dynamically balanced, hydraulically driven compressor/pump apparatus for resonant free piston Stirling engines. 4,450,685, Cl. 60-520.000.

Cosden Technology, Inc.: *See—*
De Clippeleir, Georges E. M. J.; Cahen, Raymond M.; and Martins Mendes Cerejo, Francisco A., 4,451,686, Cl. 585-444.000.

Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,451,586, Cl. 521-88.000.

Cosmo, Nicola: *See—*
Grabbe, Dimitry; Bakermans, Johannes C. W.; Cosmo, Nicola; and Korsunsky, Iosif, 4,451,818, Cl. 339-75.0MP.

Cosner, Charles G.: *See—*
Ulry, Donald C.; Cosner, Charles G.; and Ryan, Thomas D., 4,451,264, Cl. 8-508.000.

Coss, William W., to Quaker Oats Company, The. Catalyst composition and method for curing furan-based foundry binders. 4,451,577, Cl. 502-167.000.

Cotsworth, Robert P.: *See—*
Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., 4,451,221, Cl. 425-8.000.

Couillaud, Bernard J.: *See—*
Hansch, Theodor W.; and Couillaud, Bernard J., 4,451,923, Cl. 372-32.000

Cousineau, Bernard L. Drill attachment. 4,450,919, Cl. 173-29.000.

Cowan, Larry C.: *See—*
Brouwer, Charles W.; and Cowan, Larry C., 4,450,874, Cl. 139-429.000.

Cowan, William S., to Armco Inc. Apparatus for connecting a tension member to an under-water anchoring base. 4,451,170, Cl. 403-57.000.

Cox, Allen R.: *See—*
Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,451,344, Cl. 204-192.00R.

Cox, Theodore W. Fishing net. 4,450,643, Cl. 43-12.000.

Coy, Vernon W.: *See—*
Anthony, Frank H.; and Coy, Vernon W., 4,451,726, Cl. 219-413.000.

CPG Products Corp.: *See—*
Van Sickle, James R., 4,450,772, Cl. 104-295.000.

Crain, Scott L. Mud bucket. 4,450,905, Cl. 166-85.000.

Crookston, Ronald W.; and Burney, Ivan T., to Westinghouse Electric Corp. Circuit interrupter operating mechanism having a chemical operator with stationary combustion chambers. 4,451,717, Cl. 200-82.00B.

Crosfield Electronics Limited: *See—*
Gamson, Alan R.; and Kellner, Phillip R., 4,451,552, Cl. 430-302.000.

Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Inhibition of thromboxane synthetase with 3-(heteroalkyl)-indolyl-acrylic acid derivatives. 4,451,472, Cl. 424-263.000.

Crounse, Nathan N.; and Schmidt, Paul J., to Hilton-Davis Chemical Co., The. 3,5- And 5,5-bis(3-indolyl)-2-(5H)furanones. 4,451,657, Cl. 548-456.000.

Crowley, John J.: *See—*
Chapman, William A., Jr.; and Crowley, John J., 4,450,740, Cl. 83-303.000.

CTB, Inc.: *See—*
Nilsen, Norman P.; and Novey, Richard T., 4,450,789, Cl. 119-18.000.

Cue, Berkeley W., Jr., to Pfizer Inc. Process for preparing carboline derivatives and compounds used in their preparation. 4,451,655, Cl. 546-85.000.

Cummins Engine Company, Inc.: *See—*
Morris, Corydon E.; and Jaliwala, Salim A., 4,450,783, Cl. 123-458.000.
Thedens, Kevin J.; and Roettgen, Leslie A., 4,450,801, Cl. 123-198.00F.

Currah, Walter E., Jr. Wind driven power plant-structural support. 4,451,199, Cl. 415-2.00A.

Curry, Norman R. Transport converter dolly with forced steering. 4,451,058, Cl. 280-423.00A.

Cuscurida, Michael: *See—*
Speranza, George P.; Cuscurida, Michael; and Peterson, Bruce W., 4,451,588, Cl. 521-175.000.

Cushing, David E.: *See—*
Stanley, Philip E.; Woods, William E.; Lemay, Richard A.; and Cushing, David E., 4,451,883, Cl. 364-200.000.

Cutler, John H.: *See—*
Boettner, Fred H.; Cutler, John H.; and Walker, Loren H., 4,451,770, Cl. 318-757.000.

D. Felipe Pineda S.A.: *See—*
Rovira, Felipe P., 4,451,372, Cl. 210-603.000.

D.O.V.E. Equipment Corporation: *See—*
Boettcher, William C.; Volkmer, Richard B.; and Wehde, Wayne R., 4,450,987, Cl. 222-641.000.

Dahlberg, Reinhard, to Higratherm Electric GmbH. Bipolar transistor with a plurality of parallelly connected base-collector junctions formed by plastic deformation of the crystal lattice. 4,451,843, Cl. 357-36.000.

Daicel Chemical Industries Ltd.: *See—*
Murai, Masataka; and Ishii, Kiyoshi, 4,451,370, Cl. 210-321.100.

Daigo, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture information input apparatus. 4,451,854, Cl. 358-282.000.

Daikin Kogyo Co., Ltd.: *See—*
Kawachi, Shoji; Kadowaki, Toshinori; and Yamamoto, Katsutoshi, 4,451,616, Cl. 525-178.000.

Daimler-Benz Aktiengesellschaft: *See—*
Bruhnke, Ulrich; Christoph, Bernd; Harloff, Bernd; and Krakat, Hans, 4,451,077, Cl. 296-185.000.
Hornig, Rudolf; and Worner, Gunter, 4,451,245, Cl. 464-181.000.
Scheurenbrand, Dieter, 4,450,880, Cl. 141-285.000.
Thoma, Frank; Hoffmann, Karl-Heinz; and Burckhardt, Christoph, 4,450,818, Cl. 123-502.000.

Zeilinger, Karl, 4,450,799, Cl. 123-90.530.

D'Alelio, Gaetano F.; and Waitkus, Phillip A., to Plastics Engineering Company. Polyimide derivatives having terminal acetylenic groups. 4,451,669, Cl. 562-442.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of di-acetylene-terminated polyimide with a diaryl conjugated butadiyne. 4,451,402, Cl. 548-461.000.

Dalton, John J.: *See*—
Sadler, Thomas H.; and Dalton, John J., 4,450,873, Cl. 138-174.000.

Daly, Francis P.; and Wilhelm, Frederick C., to Air Products and Chemicals, Inc. Catalyst for the hydrodealkylation of alkylaromatic compounds. 4,451,687, Cl. 585-489.000.

D'Ambrose, Camille, co-executrix: *See*—
Papathomas, Thomas V.; Scuderi, Rudolph, deceased; White, May S., co-executrix; and D'Ambrose, Camille, co-executrix, 4,451,773, Cl. 320-59.000.

Dammann, Laurence G., to Celanese Corporation. Process for preparing low molecular weight water-soluble polymers by copolymerizing with water-soluble monomers a calculated quantity of methallylsulfonate monomer. 4,451,628, Cl. 526-225.000.

Dana Corporation: *See*—
Long, Thomas F., Jr., 4,450,943, Cl. 192-70.200.

Danford, Jack D. Discing tool positionable to be transported. 4,450,918, Cl. 172-583.000.

D'Angelo, Severino; and Moore, Max J., to Horiba Instruments Incorporated. Vehicle force measurement system. 4,450,728, Cl. 73-862.280.

Danmar Products, Inc.: *See*—
Marchello, John L., 4,451,083, Cl. 297-195.000.

Danneels, Laurent: *See*—
Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, 4,451,336, Cl. 204-47.000.

Danthony, Jacques: *See*—
Cinquin, Jean-Pierre; Danthony, Jacques; and Mulertt, Charles, 4,451,866, Cl. 361-56.000.

Dantzig, Jonathan A.: *See*—
Winter, Joseph; Tyler, Derek E.; and Dantzig, Jonathan A., 4,450,893, Cl. 164-468.000.

Dardano, Alberto: *See*—
Bocci, Giorgio; Dardano, Alberto; Levaggi, Vittorio; and Milani, Ambrogio, 4,451,230, Cl. 431-284.000.

Dario Manuli S.p.A.: *See*—
Grossi, Renzo, 4,450,668, Cl. 53-176.000.

Dart Controls, Inc.: *See*—
Penn, Paul E.; and Waymire, John W., 4,451,823, Cl. 340-648.000.

D'Augustine, Frank T.; Terry, Malcolm E.; Welsh, Hugh F.; and Payne, Frank A., to RCA Corporation. Automatic mask-frame inserter. 4,451,243, Cl. 445-68.000.

Davenport, Henry A.; and Barrows, Robert E., to Ingersoll-Rand Company. Air line lubricator. 4,450,938, Cl. 184-42.000.

David, Gabor: *See*—
Veisz, Gyorgy; David, Gabor; Koszeghy, Peter; and Szekely, Lajos, 4,451,804, Cl. 333-177.000.

Davies, Phineas; Jennings, James R.; and Wolstenholme, Jack, to Imperial Chemical Industries PLC. Catalyst, catalyst support and oxychlorination process. 4,451,683, Cl. 570-224.000.

Davis, Dean E.: *See*—
Chichester, Willard L.; and Davis, Dean E., 4,451,095, Cl. 303-71.000.

Davis, James C.: *See*—
Peterson, Dennis P.; and Davis, James C., 4,451,374, Cl. 210-656.000.

Davis, Max L. Tractor muffler structure. 4,450,934, Cl. 181-228.000.

Davis, Thomas A. Cover plate for an electrical receptacle. 4,451,101, Cl. 339-44.00M.

Davy McKee (London) Limited: *See*—
Bradley, Michael W.; Hiles, Andrew G.; and Kippax, John W., 4,451,677, Cl. 568-881.000.

Day, Joseph G.: *See*—
Hill, John; and Day, Joseph G., 4,451,290, Cl. 75-63.000.

Dean, E. Keith; and Emmons, Phillips C. Thermal barrier. 4,450,660, Cl. 52-202.000.

Dearden, Ziba T.; and Puri, Yogi K., to International Business Machines Corporation. Transmission logic parity circuit. 4,451,922, Cl. 371-49.000.

deBin, Rene F. Manufacture of thermoplastic bags. 4,451,249, Cl. 493-204.000.

Deckler, Harry C., to White Farm Equipment Company. Seed metering means. 4,450,979, Cl. 221-263.000.

De Clippeleir, Georges E. M. J.; Cahen, Raymond M.; and Martins Mendes Cerejo, Francisco A., to Cosden Technology, Inc. Dehydrogenation process. 4,451,686, Cl. 585-444.000.

DeCoursey, Calvin H., to Lynch Communication Systems, Inc. Method and apparatus for pulse train synchronization in PCM transceivers. 4,451,917, Cl. 370-108.000.

Decroix, Jean C., to Societe Chimique des Charbonnages S.A. Compositions for sealing products. 4,451,598, Cl. 524-69.000.

Dectron Inc.: *See*—
Taylor, John H., 4,450,691, Cl. 62-140.000.

Decuq, Guy; and Mouterde, Anne, to Verdol S.A. Package-lifting system in an unwinding or twisting machine. 4,451,006, Cl. 242-18.0DD.

Deere & Company: *See*—
Love, Mahlon L., 4,450,671, Cl. 56-14.600.
Wohlford, William P., 4,451,097, Cl. 305-40.000.

DeGraw, Joseph I., Jr.: *See*—
Berger, Frank M.; DeGraw, Joseph I., Jr.; and Johnson, Howard L., 4,451,474, Cl. 424-266.000.

DeHaai, Kermit M. Self-propelled disk harrow. 4,450,915, Cl. 172-55.000.

Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., to Sandoz Ltd. Pharmaceutical compositions containing biodegradable polymers. 4,451,452, Cl. 424-78.000.

Deininger, J. Paul; and Dotson, Ronald L., to Olin Corporation. Process for making a calcium/sodium ferrate adduct by the electrochemical formation of sodium ferrate. 4,451,338, Cl. 204-86.000.

DeKezel, James A.; and Lerschen, James R. Buoyant water fowl decoy. 4,450,642, Cl. 43-3.000.

Delavarenne, Serge: *See*—
Bourson, Lucien; Delavarenne, Serge; and Tellier, Pierre, 4,451,333, Cl. 162-77.000.

Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., to General Foods Corporation. Real cream frozen whipped topping composition. 4,451,492, Cl. 426-564.000.

Demaegd, Luc: *See*—
Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, 4,451,336, Cl. 204-47.000.

de Mena, Henry F.; and Tanoff, Michael A., to Exxon Research and Engineering Co. Control scheme and apparatus for a cogeneration boiler. 4,451,003, Cl. 236-14.000.

De Neya, Robert: *See*—
Vandeveide, Jean; and De Neya, Robert, 4,451,446, Cl. 424-92.000.

Denzinger, Walter; Goertz, Hans-Helmut; Sanner, Axel; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Preparation of insoluble, only slightly swellable polymers of basic vinyl-heterocyclic compounds. 4,451,582, Cl. 521-38.000.

DePalma, Vincent M.; Dilley, Reginald J.; Doerner, Mary F.; and Nepela, Daniel A., to International Business Machines Corporation. Magnetic recording composition employing mono-dispersed spherical load-bearing particles. 4,451,532, Cl. 428-336.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys; and Richards, Ronald L., 4,451,603, Cl. 524-279.000.

Dessenoix, Pierre: *See*—
Dessenoix, Robert; and Dessenoix, Pierre, 4,450,853, Cl. 137-212.000.

Dessenoix, Robert; and Dessenoix, Pierre. Assembly for drawing off a liquid by means of a gas under pressure. 4,450,853, Cl. 137-212.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Flute chorus generator for a polyphonic tone synthesizer. 4,450,746, Cl. 84-1.240.

Development Finance Corp. of New Zealand: *See*—
Lustig, Thomas P., 4,450,762, Cl. 99-584.000.

DeVillez, Richard L., to Brown, James Howard. Method of treating acne using ozonized materials. 4,451,480, Cl. 424-278.000.

DeVries, Donald H.: *See*—
Harper, William P.; and DeVries, Donald H., 4,451,694, Cl. 174-72.00B.

de Vroom, Hubertus M., to Nordipa AG. Transferable enamel sheet and method and apparatus for its fabrication. 4,451,522, Cl. 428-201.000.

Dewert, Heribert: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,451,435, Cl. 422-171.000.

Diamond Crystal Salt Company: *See*—
Heiss, John F.; and Kolasinski, Richard, 4,451,381, Cl. 252-1.000.

Diana, Guy D., to Sterling Drug Inc. Isoxazoles as antiviral agents. 4,451,476, Cl. 424-272.000.

Dickinson, Roger P.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,451,472, Cl. 424-263.000.

Dickore, Karlfried; and Kuhle, Engelbert, to Bayer Aktiengesellschaft. N-Substituted imido-dicarboxylic acid diaryl ester method of preparation. 4,451,406, Cl. 260-465.00D.

DiDomenico, Edward, Jr., to Henkel Corporation. Urethane prepolymers crosslinked with amino crosslinking agents. 4,451,622, Cl. 525-456.000.

Diebold Incorporated: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; Newton, Kevin H.; and Bozzelli, John C., 4,450,978, Cl. 221-13.000.

Diedrich, Heinz K.; Greco, Giovanni; and Fanti, Domenico, to Selenia, Industrie Elettroniche Associate, S.p.A. Cryogenic radiation detector with high-density conductor array. 4,451,735, Cl. 250-352.000.

Diery, Helmut; Wester, Norbert; and Hille, Martin, to Hoechst Aktiengesellschaft. Cationic ethylene oxide/propylene oxide and ethylene oxide/butylene oxide polymers, a process for their preparation and their use. 4,451,671, Cl. 564-286.000.

Diesel Kiki Company, Ltd.: *See*—
Takefuta, Hideyasu; and Shinoda, Akira, 4,450,942, Cl. 192-48.900.

Dietz, Erwin; and Munkel, Albert, to Hoechst Aktiengesellschaft. Imidazoline addition compounds. 4,451,656, Cl. 548-352.000.

Dilley, Reginald J.: *See*—
DePalma, Vincent M.; Dilley, Reginald J.; Doerner, Mary F.; and Nepela, Daniel A., 4,451,532, Cl. 428-336.000.

Dillon Company, The: *See*—
Dillon, Thomas J., 4,450,617, Cl. 29-430.000.

Dillon, Thomas J., to Dillon Company, The. System for and assembly of a prefabricated home module. 4,450,617, Cl. 29-430.000.

Di Marchi, Richard D., to Eli Lilly and Company. Process for inhibiting undesired thiol reactions during cyanogen bromide cleavage of peptides. 4,451,396, Cl. 260-112.00R.

Dinius, Harold B.; and Huizenga, John R., to Eli Lilly and Company. Implant system. 4,451,254, Cl. 604-62.000.

Discount, Dennis: *See*—
Venning, Scott; and Discount, Dennis, 4,450,821, Cl. 123-525.000.

Discovision Associates: *See*—
Elliott, James E., 4,451,913, Cl. 369-110.000.

Display Interface Corporation: *See*—
Whetstone, Albert L.; and Shaklee, Kerry L., 4,451,698, Cl. 178-19.000.

Distler, Harry: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.

Dixi S.A. Usine 4: *See*—
Remy, Jean-Claude, 4,450,826, Cl. 125-11.00N.

Dobes, Karel; Fuchs, Peter; and Rudolf, Otmar. Refractometer. 4,451,147, Cl. 356-135.000.

Doehler, Joachim; Gattuso, David A.; and Hoffman, Kevin R., to Energy Conversion Devices, Inc. Grooved gas gate. 4,450,786, Cl. 118-719.000.

Doerner, Mary F.: *See*—
DePalma, Vincent M.; Dilley, Reginald J.; Doerner, Mary F.; and Nepela, Daniel A., 4,451,532, Cl. 428-336.000.

Dola, Frank P.; and Lauterbach, John H., to AMP Incorporated. High speed modular connector for printed circuit boards. 4,451,107, Cl. 339-143.00R.

Dolezalek, Friedrich; Koepke, Gunther; and Rendelmann, Ulrich, to Agfa-Gevaert Aktiengesellschaft. Process for the pretreatment of photographic substrates. 4,451,497, Cl. 427-39.000.

Dolman, Hendrik; and Kuipers, Johannes, to Duphar International Research B.V. Nitrothiophenes, fungicidal and/or bactericidal compositions containing nitrothiophenes, and use thereof. 4,451,660, Cl. 549-63.000.

Domogalla, John C., to Texas Instruments Incorporated. Combination of analog to digital converter and error correction circuit. 4,451,821, Cl. 340-347.0AD.

Doner, Claude E., to RCA Corporation. Tuning means for a transmission line cavity. 4,451,806, Cl. 333-224.000.

Donoghue, William J.; and Tesch, Rodney C., to Motorola, Inc. Pull-up circuit for a memory. 4,451,907, Cl. 365-203.000.

Donovan, John S. Gas operated automatic weapon. 4,450,752, Cl. 89-142.000.

Dorosz, Adolph S.: *See*—
Wickers, Francis A.; and Dorosz, Adolph S., 4,450,781, Cl. 112-262.100.

Dorries, Peter: *See*—
Piesch, Steffen; and Dorries, Peter, 4,451,620, Cl. 525-398.000.

Dotson, Ronald L.: *See*—
Deininger, J. Paul; and Dotson, Ronald L., 4,451,338, Cl. 204-86.000.

Dougherty, William R.; Colby, Dwight D.; Fahley, Jerome A.; and Van Dyke, Martin J., to Honeywell Inc. Liquid gaging system multiplexing. 4,451,894, Cl. 364-509.000.

Dover Corporation: *See*—
Cannon, Fleming V., Jr.; and Casteel, Frankie E., 4,451,193, Cl. 414-563.000.
Wood, Chester W., 4,450,879, Cl. 141-209.000.

Dow Chemical Company, The: *See*—
Bounds, Charles T., 4,451,675, Cl. 568-726.000.
Buske, Gary R.; and Pews, Richard G., 4,451,408, Cl. 260-505.00R.
Buske, Gary R.; and Pews, Richard G., 4,451,409, Cl. 260-513.00R.
Colburn, Lyle W.; Potter, Craig W.; and Romesberg, Floyd E., 4,450,977, Cl. 220-458.000.
Frisch, Kurt C., Jr.; Lock, Michele R.; and Stuk, Gregory J., 4,451,627, Cl. 526-192.000.
Gibbs, Dale S.; and Treptow, Warren L., 4,451,632, Cl. 526-317.000.
Grinstead, Robert R., 4,451,375, Cl. 210-670.000.
Jeffrey, Gaines C.; Cooper, Lance A.; and Whipple, Sharon S., 4,451,442, Cl. 423-224.000.
Klun, Robert T.; and Regulski, Thomas W., 4,451,667, Cl. 560-207.000.
Lay, George E.; and Haigh, Daniel H., 4,451,453, Cl. 424-81.000.
Meyer, Louis W., 4,451,425, Cl. 264-300.000.
Pawloski, Chester E., 4,451,653, Cl. 544-238.000.
Peterson, Dennis P.; and Davis, James C., 4,451,374, Cl. 210-656.000.
Shipley, Randall S.; and Birkelbach, Donald F., 4,451,626, Cl. 526-122.000.

Drake, Kenneth; and Hammock, Richard A., to Union Carbide Corporation. Amphoteric acrylic ester based latexes. 4,451,608, Cl. 524-560.000.

Dresser Industries, Inc.: *See*—
Bliven, David L., 4,451,046, Cl. 277-3.000.
Elphick, James, 4,450,914, Cl. 166-325.000.

Driedger, Klaus U., to ABL Engineering Ltd. Pre-fabricated grain elevator. 4,450,657, Cl. 52-79.900.

Drozhin, Vitaly F.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Victor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Dryan-Fordahl Technologies S.A.: *See*—
Stolz, Silvano; and Huguenin, Raymond, 4,451,754, Cl. 310-348.000.

Drysdale, William H.: *See*—
Kirkendall, Richard D.; Drysdale, William H.; and Kokinakis, Louis D., 4,450,770, Cl. 102-523.000.

Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E. Data processing system. 4,451,882, Cl. 364-200.000.

Dubicki, Henryk: *See*—
Parsons, Jack L.; Vizine, Dan; Sumner, Mark; Marathe, Suresh; and Dubicki, Henryk, 4,451,648, Cl. 536-54.000.

DuBois, George W.: *See*—
Holdsworth, Timothy M.; Hesler, Joseph P.; and DuBois, George W., 4,451,803, Cl. 333-12.000.

Dubois, Guy, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux - E.F.C.I.S. Manufacturing TaSi-polysilicon conductors having high-resistance elements by a liftoff technique. 4,451,328, Cl. 156-656.000.

Dubois, Jean C.: *See*—
Loiseaux, Brigitte; Huignard, Jean P.; Dubois, Jean C.; and Eranian, Armand, 4,451,412, Cl. 264-1.300.

Dubroeucq, Marie-Christine; and Rataud, Jean E. M. A., to Pharmindustrie. 10-(1-Aza-[2,2,2)-bicyclo-3-octyl]-10H-2-phenothiazinesulfonamide and derivatives thereof. 4,451,461, Cl. 424-246.000.

Duester, Everett L., to John Thomas Batts, Inc. Hanger with size indicator panel. 4,450,639, Cl. 40-322.000.

Duff, Raymond J.: *See*—
Baird, Phillips C.; and Duff, Raymond J., 4,451,540, Cl. 428-615.000.

Dunlop Limited: *See*—
Jackson, William L., 4,451,313, Cl. 156-132.000.

Dunwoody, John A. Fly trap gun. 4,450,649, Cl. 43-135.000.

Duphar International Research B.V.: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,451,660, Cl. 549-63.000.

Du Pont de Nemours, E. I., and Company: *See*—
Fickes, Michael G.; and Rakoczy, Bohdan, 4,451,553, Cl. 430-306.000.
Frazer, August H.; and Harris, John F., Jr., 4,451,642, Cl. 528-347.000.
Fry, Grant C., 4,451,600, Cl. 524-196.000.
Ganti, Venkat, 4,451,470, Cl. 424-260.000.
Nugent, William A., 4,451,665, Cl. 560-202.000.
Romanauskas, William A., 4,451,250, Cl. 494-85.000.
Victorius, Claus, 4,451,597, Cl. 524-39.000.
Williams, John F., 4,451,248, Cl. 494-84.000.

Durr, Dieter: *See*—
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,451,284, Cl. 71-94.000.

Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, to American Cyanamid Company. Therapeutically active 3-amino-1-halogenated phenyl-2-pyrazolines and their C4 and C5 analogs. 4,451,479, Cl. 424-273.00P.

Duval, Eugene F.; Bagahaw, David P.; Kast, Michael A.; Masters, Gilbert M.; and Whitehouse, Harry T. Freeze protection apparatus for solar collectors. 4,450,868, Cl. 137-625.290.

Duval, Henry H. Method for restructuring railway roadbeds. 4,451,180, Cl. 405-269.000.

Dvorak, Bolek, to Moerman, Richard A.; and Sullivan, Barry. Apparatus for forming structural sheets from fibrous biological waste. 4,451,322, Cl. 156-461.000.

Dye, Richard W., Jr.: *See*—
Wolfe, Donald W.; and Dye, Richard W., Jr., 4,451,901, Cl. 364-900.000.

Dynaforce Corporation: *See*—
Catan, Robert S., 4,450,755, Cl. 98-36.000.

Dynie, Ernest R., to Black & Decker Inc. Pulley mounting means for power lawn rake. 4,450,672, Cl. 56-16.700.

Dzewaltowski, Victor F.: *See*—
Reda, Kazimierz J.; Dzewaltowski, Victor F.; Millay, Lawrence I.; and Hobbs, Robert N., 4,450,651, Cl. 51-5.00D.

Dzieciuch, Matthew A.; Wroblowa, Halina S.; and Kummer, Joseph T., to Ford Motor Company. Rechargeable zinc/manganese dioxide cell. 4,451,543, Cl. 429-206.000.

E. R. Squibb & Sons, Inc.: *See*—
Jensen, Ole R., 4,451,258, Cl. 604-333.000.

Eagle Comtronics, Inc.: *See*—
Holdsworth, Timothy M.; Hesler, Joseph P.; and DuBois, George W., 4,451,803, Cl. 333-12.000.

Early, Judson H.: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,451,318, Cl. 156-353.000.
Off, Joseph W. A.; and Early, Judson H., 4,451,319, Cl. 156-353.000.

Eastman, George Y.: *See*—
Shaubach, Robert M.; Eastman, George Y.; and Roehm, Vincent P., 4,451,210, Cl. 417-52.000.

Eastman Kodak Company: *See*—
Farley, Ronald W., 4,451,137, Cl. 355-14.00C.
Foote, James C., Jr., 4,450,950, Cl. 198-478.000.
Leonard, Eric M.; Geyer, Frederick F.; and Myers, George M., 4,451,836, Cl. 346-137.000.

Lok, Roger; Freeman, John P.; and Baum, William N., 4,451,557, Cl. 430-505.000.
Meyers, John J.; and Pulver, John C., 4,451,119, Cl. 350-310.000.
Moberg, Gregory D.; and Hudson, Lynn R., 4,451,772, Cl. 320-1.000.
Pingaud, Bernard J.; and Poncet, Claude, 4,451,535, Cl. 428-329.000.
Sublett, Bobby J.; and Hilbert, Samuel D., 4,451,641, Cl. 528-295.500.

Eaton Corporation: *See*—
Brown, Wade R., 4,450,863, Cl. 137-613.000.
Zukausky, Keith E., 4,450,696, Cl. 68-18.0FA.
Zukausky, Keith E., 4,451,809, Cl. 335-255.000.

Eaves, Terence: *See*—
Walker, Stephen E.; Bedford, Keith; and Eaves, Terence, 4,450,877, Cl. 141-1.000.

Ebisawa, Hisashi: *See*—
Ishikawa, Masayuki; Eguchi, Yukuo; Moriguchi, Soyao; and Ebisawa, Hisashi, 4,451,467, Cl. 424-251.000.

Edak AG: *See*—
Sieber, Willi, 4,450,963, Cl. 206-521.000.

Eddins, Fred D.: *See*—
Holden, John E.; Eddins, Fred D.; and Kimbrough, Richard W., 4,450,650, Cl. 46-17.000.

Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., to National Research Development Corporation. Methods of producing image information from objects. 4,451,788, Cl. 324-309.000.

Edmonds, James T., Jr.; and Sherk, Fred T., to Phillips Petroleum Company. Production of arylene sulfide polymer beads. 4,451,643, Cl. 528-387.000.

Eguchi, Shinsuke: *See*—
Fujioka, Kazuyoshi; and Eguchi, Shinsuke, 4,450,944, Cl. 192-70.120.

Eguchi, Yukuo: *See*—
Ishikawa, Masayuki; Eguchi, Yukuo; Moriguchi, Soyao; and Ebisawa, Hisashi, 4,451,467, Cl. 424-251.000.

Eheim, Franz; and Hofer, Gerald, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,450,805, Cl. 123-387.000.

Eigen, Edward: *See*—
Tavss, Edward A.; Eigen, Edward; and Clark, Kenneth F., 4,451,385, Cl. 252-132.000.

Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Fungicidal and plant growth-regulating 1-azolyl-2-oximinobutane and use. 4,451,281, Cl. 71-92.000.

Elder, Robert E.: *See*—
Kempner, Marvin A.; and Elder, Robert E., 4,451,700, Cl. 179-2.0AS.

Elektro-Mechanik GmbH: *See*—
Heuer, Dieter; and Schmiedke, Georg, 4,451,750, Cl. 310-88.000.

Elettrochimica Marco Ginatta SpA: *See*—
Ginatta, Marco V., 4,451,340, Cl. 204-117.000.

Elgas, Roger J.; and Gordon, Timothy M., to Cobe Laboratories, Inc. Blood oxygenator. 4,451,562, Cl. 435-2.000.

Eli Lilly and Company: *See*—
Di Marchi, Richard D., 4,451,396, Cl. 260-112.00R.
Dinius, Harold B.; and Huizenga, John R., 4,451,254, Cl. 604-62.000.

Elliott, Denvier D., Jr. Golf training aid. 4,451,044, Cl. 273-189.00A.

Elliott, James E., to Discovision Associates. Video disc read back scanner. 4,451,913, Cl. 369-110.000.

Elliott, Robert D.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,451,650, Cl. 544-105.000.

Ellis, Alan E. H. Security devices for rotatable members and fluid flow control valves incorporating such devices. 4,450,697, Cl. 70-178.000.

Ellis, Thomas E.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.

Elphick, James, to Dresser Industries, Inc. Well treatment valve. 4,450,914, Cl. 166-325.000.

Emmons, Lawrence D.: *See*—
Mayer, Steven T.; and Emmons, Lawrence D., 4,451,900, Cl. 364-900.000.

Emmons, Phillips C.: *See*—
Dean, E. Keith; and Emmons, Phillips C., 4,450,660, Cl. 52-202.000.

Empak Inc.: *See*—
Johnson, Douglas M., 4,450,960, Cl. 206-334.000.

Endo, Tetsuhiko: *See*—
Ohkubo, Tadahiko; Endo, Tetsuhiko; and Andoh, Akiwo, 4,451,007, Cl. 242-18.00R.

Energy Conversion Devices, Inc.: *See*—
Doehler, Joachim; Gattuso, David A.; and Hoffman, Kevin R., 4,450,786, Cl. 118-719.000.
Yu, Terry T., 4,451,556, Cl. 430-346.000.

Energy Innovation Enterprises, Ltd.: *See*—
Gaunt, John; and Gregory, Kenneth E., 4,450,721, Cl. 73-290.00B.

Engel, Rolf R., to Minneapolis Medical Research Foundation, Inc. Device for shielding human skin from ambient light to facilitate tests performed thereon. 4,450,845, Cl. 128-743.000.

Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, to Cassella Aktiengesellschaft. Agent and method for deoiling sand and rock masses. 4,451,631, Cl. 526-287.000.

Engelmohr, Gustav O., to Siemens Gammasonics, Inc. Method and apparatus for forming collimator strips. 4,450,706, Cl. 72-385.000.

Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, to Agfa-Gevaert Aktiengesellschaft. Film winding spool for photographic camera. 4,451,011, Cl. 242-71.000.

Engstrom, Olof: *See*—
Brogardh, Torgny; Engstrom, Olof; and Ovren, Christer, 4,451,730, Cl. 250-227.000.

Enomoto, Michitoshi; and Shimizu, Yasuo, to Nakamura Kinzoku Kogyosho, Inc. Method of producing suction manifolds for automobile engines. 4,450,886, Cl. 164-75.000.

Enomoto, Seiji: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; Enomoto, Seiji; and Mezawa, Tsutomu, 4,451,908, Cl. 365-222.000.

Ephraim, Bernard. Keyboard carrier. 4,450,993, Cl. 224-265.000.

Eranian, Armand: *See*—
Loiseaux, Brigitte; Huignard, Jean P.; Dubois, Jean C.; and Eranian, Armand, 4,451,412, Cl. 264-1.300.

Erasov, Fedor N.; Chumachenko, Boris A.; and Potaichuk, Vladimir M., to Zaporozhsky Konstruktorsko-Tekhnologichesky Institut Selskokhozyaistvennogo Mashinostroenia. Planetary hydraulic motor with stator gear hinged to a housing. 4,451,216, Cl. 418-61.00B.

Erken, Manfred: *See*—
Wolfrum, Erhard; Erken, Manfred; and Bocker, Dietrich, 4,450,777, Cl. 110-342.000.

Ernest, Michael V.; and Maselli, James M., to W. R. Grace & Co. Method for exhaust gas treatment. 4,451,441, Cl. 423-213.200.

Ernst, Helmut; Gehrhardt, Karl-Heinz; Uhl, Leopold; and Wolert, Hartmut, to Metallgesellschaft Aktiengesellschaft. Nozzle block for rotary kilns. 4,451,232, Cl. 432-103.000.

ETA S.A. Fabriques d'Ebauches: *See*—
Fluck, Josef, 4,451,160, Cl. 368-290.000.
Muller, Jacques, 4,451,161, Cl. 368-220.000.

Ethicon, Inc.: *See*—
Mericle, Robert W.; and Transue, James A., 4,450,840, Cl. 128-325.000.
Transue, James A., 4,450,839, Cl. 128-325.000.

Ethyl Corporation: *See*—
Everly, Charles R., 4,451,676, Cl. 568-780.000.
Stahly, G. Patrick, 4,451,658, Cl. 548-562.000.

Eue, Ludwig: *See*—
Knops, Hans-Joachim; Babczinski, Peter; Eue, Ludwig; and Schmidt, Robert, 4,451,282, Cl. 71-92.000.

Eventoff, Franklin N. Spacerless keyboard switch circuit assembly. 4,451,714, Cl. 200-5.00A.

Everly, Charles R., to Ethyl Corporation. Chemical process for the preparation of para-alkenyl phenol. 4,451,676, Cl. 568-780.000.

Evers, William J.; Stork, Gilbert; Mookherjee, Barja D.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. Synthesis of triconjugated dienones and novel intermediates used in said process. 4,451,392, Cl. 252-522.00R.

Ewan, David B.: *See*—
Phillipps, Gordon H.; Humber, David C.; Ewan, David B.; and Coomber, Barry A., 4,451,405, Cl. 260-397.100.

Ewener, Patrick C.: *See*—
Briens, Cedric L.; Sankey, Bruce M.; and Ewener, Patrick C., 4,451,353, Cl. 208-33.000.

Ex-Cell-O Corporation: *See*—
Reda, Kazimierz J.; Dzewaltowski, Victor F.; Millay, Lawrence I.; and Hobbs, Robert N., 4,450,651, Cl. 51-5.00D.

Exxon Research and Engineering Co.: *See*—
Briens, Cedric L.; Sankey, Bruce M.; and Ewener, Patrick C., 4,451,353, Cl. 208-33.000.
Cody, Ian A., 4,451,572, Cl. 502-62.000.
de Mena, Henry F.; and Tanoff, Michael A., 4,451,003, Cl. 236-14.000.
Johnson, Burnett H., 4,451,574, Cl. 502-115.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,451,673, Cl. 568-454.000.
Pieters, Wim J.M.; and Prilutski, Gerard M., 4,451,356, Cl. 208-263.000.
Stuntz, Gordon F., 4,451,354, Cl. 208-56.000.

Eydt, Andre J.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

F.I.S., s.r.l. Macchinari Per Imballaggi: *See*—
Grossi, Renzo, 4,450,668, Cl. 53-176.000.

Faber, Manfred: *See*—
Troeder, Christoph; Faber, Manfred; and Seigert, Peter, 4,450,729, Cl. 73-862.340.

Fache, Jean-Paul: *See*—
Le Cann, Robert; and Fache, Jean-Paul, 4,450,953, Cl. 198-778.000.

Fahley, Jerome A.: *See*—
Dougherty, William R.; Colby, Dwight D.; Fahley, Jerome A.; and Van Dyke, Martin J., 4,451,894, Cl. 364-509.000.

Fahrbach, Erich: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,451,314, Cl. 156-148.000.
Tecl, Bohuslav; Fahrbach, Erich; Knoke, Jurgen; and Assent, Hans C., 4,451,520, Cl. 428-198.000.

Fanti, Domenico: *See*—
Diedrich, Heinz K.; Greco, Giovanni; and Fanti, Domenico, 4,451,735, Cl. 250-352.000.

Fanuc Ltd.: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,451,902, Cl. 365-1.000.

Farley, Ronald W., to Eastman Kodak Company. Adjusting copier copy contrast and density during production runs. 4,451,137, Cl. 355-14.00C.

Farley, Wilbur H.; Kotek, Alfred J.; and Carlson, John H., to USM Corporation. Ball separator assembly. 4,451,098, Cl. 308-201.000.

Fasching, George E., to United States of America, Energy. Single transmission line data acquisition system. 4,451,826, Cl. 340-825.070.

Fasco Controls Corporation: *See*—
Barry, Leon G.; and Rieman, Willis E., 4,451,814, Cl. 337-407.000.

Fazio, Martin V.: *See*—
Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,450,961, Cl. 206-349.000.

Featherstone, Elmer F. Card holder. 4,450,955, Cl. 206-39.600.

Felix Schoeller, Jr., GmbH & Co., KG: *See*—
Spelsberg, Hans-Hugo, 4,451,362, Cl. 210-150.000.

Ferreira, Americo S. Toothpaste dispenser. 4,450,982, Cl. 222-93.000.

Ferrigno, Elisa L. Artificial fingernail forming method, composition and kit. 4,450,848, Cl. 132-73.000.

Ferrini, Pier G.; and Goschke, Richard, to Ciba-Geigy Corporation. Certain 2,4,5-tri-substituted triazoles, pharmaceutical compositions containing same and methods of using same. 4,451,471, Cl. 424-263.000.

Fesmire, Charles E. Steer or calf legs practice roping device. 4,451,045, Cl. 273-338.000.

Fickes, Michael G.; and Rakoczy, Bohdan, to Du Pont de Nemours, E. I., and Company. Halogen finishing of flexographic printing plates containing butadiene/acrylonitrile copolymers. 4,451,553, Cl. 430-306.000.

Fidelski, Igor A.: *See*—
Petrov, Georgi M.; Boev, Kiril K.; Fidelski, Igor A.; and Pirgov, Yordan T., 4,450,675, Cl. 57-6.000.

Filhol, Stuart J. Dental anchoring means. 4,451,237, Cl. 433-225.000.

Filler, Raymond L.: *See*—
Vig, John R.; and Filler, Raymond L., 4,451,755, Cl. 310-361.000.

Fink, Richard R., to Heyman Manufacturing Co. Connector assembly. 4,451,695, Cl. 174-87.000.

Firestone Tire & Rubber Company, The: *See*—
Lohr, Delmar F.; and Schulz, Donald N., 4,451,576, Cl. 502-155.000.

Firmin, Daniel. Apparatus for measuring the weight of the drill string. 4,450,906, Cl. 166-113.000.

Fischer, Artur. Hinge joint for hollow panels for covering swimming pools or the like. 4,450,883, Cl. 160-229.00R.

Fischer, David A., to Ace Orthopedic Manufacturing, Inc. External fixation device. 4,450,834, Cl. 128-92.0EB.

Fischer, Werner; and Locher, Johannes, to Robert Bosch GmbH. Short-circuit-resistant trigger circuit layout for an electrical consumer. 4,451,778, Cl. 323-282.000.

Fitzpatrick, John. Method and apparatus for rejuvenating rubber balls and the like. 4,450,667, Cl. 53-127.000.

Five X Corporation: *See*—
Buschor, Josef J.; Long, James C.; and Schmidt, Dieter K., 4,450,949, Cl. 198-422.000.

Flakt Aktiebolag: *See*—
Jakobsson, Per-Olof; and Beverskog, Sven, 4,450,899, Cl. 165-39.000.

Flanders Filters, Inc.: *See*—
Wood, Joseph A., 4,450,964, Cl. 206-527.000.

Flango, William E.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Flanigan, Richard J.: *See*—
Hitchcock, Lonnie G.; and Flanigan, Richard J., 4,450,882, Cl. 144-145.00A.

Flannigan, William T., to Imperial Chemical Industries Inc. Compositions for the control of unwanted foam and their use. 4,451,390, Cl. 252-321.000.

Flatau, Karsten, to Chemische Werke Huels, AG. Process for the production of pourable, tack-free vinyl chloride graft polymers. 4,451,614, Cl. 525-80.000.

Flentge, Charles A.; and Kirkemo, Curtis L., to Abbott Laboratories. Substituted theophylline salts. 4,451,652, Cl. 544-229.000.

Fletcher Engineering, Inc.: *See*—
Fletcher, J. Lawrence, 4,450,653, Cl. 51-211.00R.

Fletcher, J. Lawrence, to Fletcher Engineering, Inc. Knife sharpener. 4,450,653, Cl. 51-211.00R.

Flocke, Gunter; Jutte, Hans; Linde, Klaus; Klamke, Winfried; and Hampel, Werner, to Gewerkschaft Eisenhutte Westfalia. Apparatus for and method of driving tunnels. 4,451,176, Cl. 405-146.000.

Floeter, Wilfried; Schoening, Gerhard; and Schroeer, Klaus, to Herman C. Starck Berlin; and Uranerzbergbau-GmbH. Process for recovering niobium and/or tantalum metal compounds from such ores further containing complexes of uranium, thorium, titanium and/or rare earth metals. 4,451,438, Cl. 423-20.000.

Florer, Richard: *See*—
Snyder, Larry L.; and Florer, Richard, 4,450,976, Cl. 220-343.000.

Fluck, Josef, to ETA S.A. Fabriques d'Ebauches. Watch with a push button. 4,451,160, Cl. 368-290.000.

FMC Corporation: *See*—
Plummer, Ernest L., 4,451,484, Cl. 424-305.000.

Fogt, James F.: *See*—
Francis, Woodie R.; and Fogt, James F., 4,450,860, Cl. 137-543.190.

Folser, Karl: *See*—
Theurer, Josef; and Folser, Karl, 4,450,771, Cl. 104-1.00R.

Fontainas, Luc M.: *See*—
Van Hecke, Michel C.; and Fontainas, Luc M., 4,451,289, Cl. 75-63.000.

Foote, James C., Jr., to Eastman Kodak Company. Work piece transfer mechanism. 4,450,950, Cl. 198-478.000.

Force, Shirley M. Offset press attachment. 4,450,629, Cl. 33-184.500.

Ford, Brian R.: *See*—
Teeter, Dennis P.; and Ford, Brian R., 4,451,030, Cl. 271-265.000.

Ford Motor Company: *See*—
Basrai, Habil S.; and Rajagopal, Ganesh, 4,450,753, Cl. 91-35.000.
Dzieciuch, Matthew A.; Wroblowa, Halina S.; and Kummer, Joseph T., 4,451,543, Cl. 429-206.000.

Foreman, Gordon T.: *See*—
Gallaro, Anthony V.; and Foreman, Gordon T., 4,451,504, Cl. 427-64.000.

Forestier, Alexandre; and Lardellier, Alain M. J., to S.N.E.C.M.A. Turbine bearing. 4,451,110, Cl. 308-184.00R.

Formulabs Industrial Inks, Inc.: *See*—
Ulry, Donald C.; Cosner, Charles G.; and Ryan, Thomas D., 4,451,264, Cl. 8-508.000.

Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Remote control system for ink zones in printing machines. 4,450,767, Cl. 101-365.000.

Forte, Don A.; and Aldava, Michael B., to Manville Service Corporation. Control circuit and system for providing emergency lighting. 4,451,762, Cl. 315-87.000.

Fraas, Lewis M., to Chevron Research Company. Three-terminal ternary III-V multicolor solar cells and process of fabrication. 4,451,691, Cl. 136-249.000.

Francis, Thomas E. Earth clod pulverizer. 4,450,916, Cl. 172-147.000.

Francis, Woodie R.; and Fogt, James F., to Copeland Corporation. Discharge valve guide. 4,450,860, Cl. 137-543.190.

Franck, Klaus; and Sauer, Werner, to Wilkhahn & Hahne GmbH & Company. Chair. 4,451,085, Cl. 297-285.000.

Frank Thornber Co.: *See*—
McKay, Richard H.; and Ryan, Geoffrey R., 4,451,728, Cl. 235-50.00R.

Frank, Walter; Bendszus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, to Bayer Aktiengesellschaft. Radiation-hardenable aqueous binder emulsions of acrylate prepolymer with unsaturated polyester emulsifier having benzyloxy and alkylene-oxy groups. 4,451,509, Cl. 427-54.100.

Franz, Dietmar; and Torggler, Norbert, to Siemens Aktiengesellschaft. Method for establishing connections between subscriber stations which operate with different transmission procedures by way of signal converters including busy-free control. 4,451,697, Cl. 178-3.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Folser, Karl, 4,450,771, Cl. 104-1.00R.

Frazer, August H.; and Harris, John F., Jr., to Du Pont de Nemours, E. I., and Company. Bis(aminoneopentyl) aromatics and polyamides derived therefrom. 4,451,642, Cl. 528-347.000.

Frechette, Thomas E.; and Reuter, Helge H., to Triumph-Adler A.G. fur Buround Informationstechnik. Inked ribbon cartridge with ribbon drag device. 4,451,166, Cl. 400-208.000.

Freed, Lawrence H.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Freeman, John P.: *See*—
Lok, Roger; Freeman, John P.; and Baum, William N., 4,451,557, Cl. 430-505.000.

Freermann, Johannes, to Carl Schmale KG. Feeder for automatic selvedging apparatus. 4,450,780, Cl. 112-147.000.

Freese, Uwe E.: *See*—
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,450,836, Cl. 128-127.000.

Freier, Hans J.: *See*—
Frank, Walter; Bendszus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, 4,451,509, Cl. 427-54.100.

Frey, Otto: *See*—
Niederer, Peter G.; and Frey, Otto, 4,450,592, Cl. 3-1.912.

Friedman, Jon. Earth photo globe. 4,451,874, Cl. 362-285.000.

Friedrich, Ludwig: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,450,767, Cl. 101-365.000.

Friese, Hans-Herbert: *See*—
Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, 4,451,261, Cl. 8-94.220.

Frigofrance S.A.: *See*—
Le Cann, Robert; and Fache, Jean-Paul, 4,450,953, Cl. 198-778.000.

Frilund, Eyvind; and Holmberg, Per. Heat recovery in aluminium-melting works. 4,451,337, Cl. 204-67.000.

Frisch, Kurt C., Jr.; Lock, Michele R.; and Stuk, Gregory J., to Dow Chemical Company, The. Addition polymerizable urethane-based anaerobic adhesives made from tin (II) organoesters. 4,451,627, Cl. 526-192.000.

Fritz, William E.; and McComb, Ronald J., to Youngstown Steel Door Co., The. Sliding gate for a railroad hopper car. 4,450,773, Cl. 105-282.00A.

Fromson, Howard A.; and Gracia, Robert F., to Fromson, Howard A. Apparatus and process for making lithographic printing plate with reinforced image. 4,451,145, Cl. 355-100.000.

Frost, John R.: *See—*
Silverman, Jerry E.; Frost, John R.; Hegedus, Elizabeth; and Glicksman, Martin, 4,451,490, Cl. 426-553.000.

Fruengel, Frank. Method of and a device for adjusting a high-speed photographic arrangement. 4,451,128, Cl. 352-84.000.

Fry, Grant C., to Du Pont de Nemours, E. I., and Company. Additive for coating compositions. 4,451,600, Cl. 524-196.000.

Fuchs, Peter: *See—*
Dobes, Karel; Fuchs, Peter; and Rudolf, Otmar, 4,451,147, Cl. 356-135.000.

Fudatsuji, Toshiharu; Imagi, Tsutomu; and Miura, Hiroshi, to Fujitsu Limited. Ink ribbon folding mechanism for a printing apparatus. 4,451,165, Cl. 400-196.100.

Fuhrer, Jack S., to RCA Corporation. Plural operating mode ambient light responsive television picture control. 4,451,849, Cl. 358-161.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Makishima, Sadao, 4,450,734, Cl. 74-665.00F.
Ohgami, Masaaki; and Matsui, Fujio, 4,451,793, Cl. 328-69.000.

Fuji Photo Film Co., Ltd.: *See—*
Kishimoto, Shinzo, 4,451,132, Cl. 354-324.000.
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, 4,451,501, Cl. 427-40.000.
Takenaka, Yuji; and Yoshikawa, Sumio, 4,451,142, Cl. 355-55.000.

Fuji Xerox Co., Ltd.: *See—*
Moriguchi, Harukiko; Kurata, Masami; and Ohmori, Takashi, 4,451,853, Cl. 358-281.000.
Nakajima, Hisao; and Moriguchi, Fujio, 4,451.834, Cl. 346-76.0PH.

Fujie, Naofumi: *See—*
Harada, Kuniyoshi; Suzumura, Nobuyasu; and Fujie, Naofumi, 4,451,887, Cl. 364-424.000.

Fujimaki, Hiroto; Ajima, Shigetoshi; and Watanabe, Kazuhiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Organic friction material. 4,451,590, Cl. 523-155.000.

Fujimaki, Hiroto: *See—*
Okuda, Kensuke; Nagai, Hirosi; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, 4,451,235, Cl. 433-201.000.

Fujioka, Kazuyoshi; and Eguchi, Shinsuke, to Nissan Motor Co., Ltd. Wet type multiple disc clutch. 4,450,944, Cl. 192-70.120.

Fujisawa, Kazuo: *See—*
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.

Fujisawa, Shigenori: *See—*
Kitamura, Minoru; Soejima, Toshiyuki; Hayashi, Tsutomu; Matsui, Hideo; and Fujisawa, Shigenori, 4,451,293, Cl. 75-257.000.

Fujita, Osamu, to Matsushita Electric Industrial Co., Ltd. B-Class complementary circuit. 4,451,799, Cl. 330-255.000.

Fujita, Yoshiyuki: *See—*
Sekino, Masaaki; Fujita, Yoshiyuki; and Ukai, Tetsuo, 4,451,369, Cl. 210-321.100.

Fujitsu Limited: *See—*
Fudatsuji, Toshiharu; Imagi, Tsutomu; and Miura, Hiroshi, 4,451,165, Cl. 400-196.100.
Itoh, Hideo; and Agatsuma, Kenji, 4,451,745, Cl. 307-475.000.
Ono, Masaaki; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,451,805, Cl. 333-195.000.
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; Enomoto, Seiji; and Mezawa, Tsutomu, 4,451,908, Cl. 365-222.000.

Fujiwara, Yoshiro: *See—*
Ono, Masaaki; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,451,805, Cl. 333-195.000.

Fukagawa, Yasuo: *See—*
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,451,401, Cl. 260-245.20T.

Fukuchi, Masakazu; Oishi, Keiji; and Yamazaki, Yoshio, to Konishiroku Photo Industry Co., Ltd. Magnetic-brush developing device. 4,451,134, Cl. 355-3.0DD.

Fukuda, Tadaji: *See—*
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,451,547, Cl. 430-128.000.

Fukuoka, Takashi; Nagao, Yoshiaki; and Tanaka, Hiroyuki, to Kioritz Corporation. Suction silencer. 4,450,933, Cl. 181-229.000.

Fuldner, William V., to RCA Corporation. Linearity adjustment of spacecraft tubular spar-type members. 4,451,828, Cl. 343-872.000.

Fuls, Ellis N.; Lifshitz, Nadia; and Vaidya, Sheila, to Bell Telephone Laboratories, Incorporated. Fabrication of MOS integrated circuit devices. 4,450,620, Cl. 29-571.000.

Furuhashi, Yasuhiro; Ishikawa, Naozi; and Kawai, Shizuo, to Nippondenso Co., Ltd. Device for adjusting injection timing of a distribution-type fuel injection pump. 4,450,819, Cl. 123-502.000.

Furukawa, Hisao; and Kato, Yasushi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. One component room temperature setting composition. 4,451,602, Cl. 524-266.000.

Furuta, Mamoru; Maeno, Yoshio; and Kobayashi, Kazuo, to NGK Insulators, Ltd. Method for forming a green body of ceramic arc tubes used for a metal vapor discharge lamp and a molding die for forming said tube. 4,451,418, Cl. 264-63.000.

Fushiki, Yasuo: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.

Fushimoto, Hideo, to Canon Kabushiki Kaisha. Electronic appliance. 4,451,121, Cl. 350-331.0R.

Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Morimoto, Kiyoshi; Takagi, Toshinori; and Watanabe, Hiroshi, 4,451,499, Cl. 427-38.000.

GAF Corporation: *See—*
Barabas, Eugene S., 4,451,296, Cl. 134-4.000.
Randall, David I., 4,451,278, Cl. 71-66.000.

Gaffney, Anne M.: *See—*
Sofranko, John A.; and Gaffney, Anne M., 4,451,666, Cl. 560-204.000.

Gagelin, Martin J., to Lear Siegler, Inc. Integral cylinder lift mechanism. 4,451,052, Cl. 280-43.230.

Gallaro, Anthony V.; and Foreman, Gordon T., to North American Philips Consumer Electronics Corp. Process for applying phosphor to the aperture mask of a cathode ray tube. 4,451,504, Cl. 427-64.000.

Galle, Edward M., Jr., to Armco Inc. Remotely operated underwater tension connector. 4,451,056, Cl. 285-3.000.

Gamble, James E., to Bunnell Plastics, Inc. Heated can rolls of high thermal efficiency. 4,450,631, Cl. 34-110.000.

Gamson, Alan R.; and Kellner, Phillip R., to Crosfield Electronics Limited. Formation of print surfaces. 4,451,552, Cl. 430-302.000.

Ganti, Venkat, to Du Pont de Nemours, E. I., and Company. Analgesic, antagonist, and/or anorectic 14-fluoromorphinans. 4,451,470, Cl. 424-260.000.

Gao Gesellschaft fur Automation und Organisation mbH: *See—*
Kaule, Wittich; and Stenzel, Gerhard, 4,451,521, Cl. 428-199.000.
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,451,530, Cl. 428-323.000.

Garavuso, Gerald M.: *See—*
Holmes, Maurice F.; and Garavuso, Gerald M., 4,451,028, Cl. 271-11.000.

Garcia, Rodrigo A.; and Martinovich, Robert J., to Phillips Petroleum Company. Poly(arylene sulfide) compositions. 4,451,607, Cl. 524-494.000.

Gardner, Peter C., to H. Cameron Gardner Ltd.; and Massey-Ferguson Services N.V. Wheeled industrial/agricultural tractors. 4,450,925, Cl. 180-89.100.

Garrett Corporation, The: *See—*
Glaser, Jerry, 4,451,163, Cl. 384-106.000.

Garrett, David W.: *See—*
Black, Denny E.; Garrett, David W.; and Coakley, Thomas A., 4,451,592, Cl. 523-206.000.

Gasparovic, George M.: *See—*
Tyler, David O.; and Gasparovic, George M., 4,451,873, Cl. 362-267.000.

Gatfield, Ian; and Sand, Theodor, to Haarmann & Reimer GmbH. Enzyme-mediated synthesis of esters and lactones. 4,451,565, Cl. 435-117.000.

Gattuso, David A.: *See—*
Doehler, Joachim; Gattuso, David A.; and Hoffman, Kevin R., 4,450,786, Cl. 118-719.000.

Gaunt, John; and Gregory, Kenneth E., to Energy Innovation Enterprises, Ltd. Apparatus for indicating quantity of liquified gas contained in a storage container. 4,450,721, Cl. 73-290.00B.

Gavrilko, Igor V.: *See—*
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Gay, Michael J., to Motorola, Inc. Auto-tuned frequency discriminator. 4,451,792, Cl. 329-145.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Schupphaus, Herbert, 4,451,090, Cl. 299-43.000.
Schupphaus, Herbert; and Knorr, Volker, 4,451,091, Cl. 299-43.000.

Gebr. Happich GmbH: *See—*
Viertel, Lothar; and Kaiser, Peter, 4,451,076, Cl. 296-97.00K.

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Gefitec S.A.: *See—*
Posso, Patrick, 4,451,020, Cl. 248-183.000.

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Ernst, Helmut; Gehrhardt, Karl-Heinz; Uhl, Leopold; and Wolert, Hartmut, 4,451,232, Cl. 432-103.000.

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Lauterburg, Rainer; and Geiger, Hans, 4,451,719, Cl. 200-159.00R.

Geissler, Ulrich C.; Grode, Gerald A.; Stith, William J.; and Williams, Ronald A., to Baxter Travenol Laboratories, Inc. Blood storage method. 4,451,259, Cl. 604-408.000.

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Gemra, Richard J.: *See—*
Hodgson, Sten E.; and Gemra, Richard J., 4,451,104, Cl. 339-99.00R.

Genakis, Joseph M. Pir. tumbler lock. 4,450,699, Cl. 70-364.00A.

General Battery Corporation: *See—*
Ostroff, Stuart S.; and Bevan, William G., 4,451,791, Cl. 324-434.000.

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Boettner, Fred H.; Cutler, John H.; and Walker, Loren H., 4,451,770, Cl. 318-757.000.
Campbell, Richard W., 4,451,606, Cl. 524-445.000.

Cheng, Bo-Ching; and Adamson, Ronald B., 4,451,445, Cl. 423-645.000.
Harding, James H., 4,451,224, Cl. 425-548.000.
Hatanaka, Masayuki; and Kurita, Atsushi, 4,451,634, Cl. 528-24.000.
Kaswinkel, K. D.; and Wynn, M. J., 4,451,297, Cl. 134-9.000.
Milkovic, Miran, 4,451,784, Cl. 324-142.000.
Sakshaug, Eugene C.; and Kresge, James S., 4,451,815, Cl. 338-21.000.
Sawada, Fred H.; Bishop, James S.; and Blaize, Llewellyn A., 4,451,786, Cl. 324-158.0MG.
Wolfe, Donald W.; and Dye, Richard W., Jr., 4,451,901, Cl. 364-900.000.

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Beale, Robert J.; Bradbury, Allen G. W.; Medcalf, Darrell G.; and Romig, William R., 4,451,489, Cl. 426-254.000.
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.
Silverman, Jerry E.; Frost, John R.; Hegedus, Elizabeth; and Glicksman, Martin, 4,451,490, Cl. 426-553.000.

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Berg, Morris, 4,451,429, Cl. 419-33.000.
Koivunen, Erkki A.; and Sherman, James F., 4,450,735, Cl. 74-781.00R.
Striese, Jim G.; Iafret, John E.; and Batterson, William D., 4,451,071, Cl. 292-341.180.
Tyler, David O.; and Gasparovic, George M., 4,451,873, Cl. 362-267.000.

General Signal Corporation: *See*—
Smith, Barry L.; and Petit, William A., 4,451,018, Cl. 246-122.00R.

Genovese, David E., to B. F. Goodrich Company, The. Auxiliary flotation system. 4,451,016, Cl. 244-107.000.

Gensike, Karl H., to Photomatrix Corporation. Automatic loader for microfiche duplicators. 4,451,144, Cl. 355-99.000.

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Gentile, Anthony L.: *See*—
Pinnow, Douglas A.; Gentile, Anthony L.; Standlee, Arlie G.; and Timper, Arthur J., 4,451,116, Cl. 350-96.340.

Geoffroy, Alain Y.: *See*—
Verse, Bernard P.; Geoffroy, Alain Y.; and Gentet, Pierre, 4,451,822, Cl. 340-642.000.

Georgia Kaolin Company, Inc.: *See*—
Thompson, Thomas D., III, 4,451,440, Cl. 423-112.000.

Georgiev, Todor G.: *See*—
Popov, Marin A.; and Georgiev, Todor G., 4,451,294, Cl. 106-75.000.

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Gerber, Arthur M.; and Loucks, Judith, to Polaroid Corporation. Chemical sensitization of silver halide grains. 4,451,560, Cl. 430-567.000.

Gerry, Martin E. Ignition system high voltage cable with minimized radio interference. 4,451,764, Cl. 315-209.00R.

Gerson, Isadore S.; and Briggs, Willard S., to Mostek Corporation. Bit operation method and circuit for microcomputer. 4,451,885, Cl. 364-200.000.

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Flocke, Gunter; Jutte, Hans; Linde, Klaus; Klamke, Winfried; and Hampel, Werner, 4,451,176, Cl. 405-146.000.
Trumper, Thomas; Rosenberg, Harry; and Weirich, Walter, 4,451,181, Cl. 405-302.000.

Gex, Jean-Francois: *See*—
Levos, Christian; Perie, Daniel; and Gex, Jean-Francois, 4,450,730, Cl. 73-864.610.

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Leonard, Eric M.; Geyer, Frederick F.; and Myers, George M., 4,451,836, Cl. 346-137.000.

Gibbs, Dale S.; and Treptow, Warren L., to Dow Chemical Company, The. High vinylidene chloride content interpolymer coating resins and method of preparation. 4,451,632, Cl. 526-317.000.

Gibson, Duane E.: *See*—
Herd, David P.; and Gibson, Duane E., 4,451,047, Cl. 277-26.000.

Gidlund, Per A. L.: *See*—
Arvidsson, Ulf K.; and Gidlund, Per A. L., 4,450,921, Cl. 173-162.00H.

Gill, Grace M.: *See*—
Nicholakopoulos, Antonios; Gill, Grace M.; and Nadin, Robert P., 4,451,593, Cl. 523-322.000.

Gillam, William A.: *See*—
Trumbull, James L.; and Gillam, William A., 4,450,666, Cl. 52-749.000.

Gillespie, Robert E.: *See*—
Allen, Joseph C.; Gillespie, Robert E.; and Burnett, David B., 4,450,913, Cl. 166-303.000.

Gillette, Garry C., to Teradyne, Inc. Test signal reloader. 4,451,918, Cl. 371-27.000.

Gillum, Richard R., to Ares, Inc. Dual shell feeding apparatus, with shell accumulators, for automatic guns. 4,450,750, Cl. 89-33.0SF.

Gilovich, Paul A.; and Toreson, James S., to Microcomputer Systems, Inc. Magnetic tape apparatus having means for leading magnetic tape from a supply reel to a take-up reel. 4,451,861, Cl. 360-84.000.

Gin, Abram. Device for yoga exercising. 4,451,034, Cl. 272-93.000.

Ginatta, Marco V., to Elettrochimica Marco Ginatta SpA. Method for the electrolytic production of lead. 4,451,340, Cl. 204-117.000.

Giordani, Pietro. Seat for a baby's push chair. 4,451,082, Cl. 297-90.000.

Giri, Ronald R.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Glaser, Jerry, to Garrett Corporation, The. Foil bearing mounting carrier. 4,451,163, Cl. 384-106.000.

Glasgow, Thomas K.: *See*—
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,451,496, Cl. 427-34.000.

Glass, Michael T.: *See*—
Glass, William T.; and Glass, Michael T., 4,450,975, Cl. 220-18.000.

Glass, William T.; and Glass, Michael T., to Mark Designs International, Inc. Wall-mounted ash tray. 4,450,975, Cl. 220-18.000.

Glatzel, Erhard: *See*—
Basista, Heinrich; and Glatzel, Erhard, 4,451,124, Cl. 350-427.000.

Glaxo Group Limited: *See*—
Phillipps, Gordon H.; Humber, David C.; Ewan, David B.; and Coomber, Barry A., 4,451,405, Cl. 260-397.100.

Glicksman, Martin: *See*—
Silverman, Jerry E.; Frost, John R.; Hegedus, Elizabeth; and Glicksman, Martin, 4,451,490, Cl. 426-553.000.

Glissmann, Karl-Heinz: *See*—
Stucke, Walter; and Glissmann, Karl-Heinz, 4,451,413, Cl. 264-26.000.

Global Marine Inc.: *See*—
Wetmore, Sherman B., 4,451,174, Cl. 405-196.000.

Goclowski, Charles: *See*—
Ricard, Paul R.; and Goclowski, Charles, 4,450,707, Cl. 72-389.000.

Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., to University Patents, Inc.; and Contracap, Inc. Custom valved cervical cap with deformable margin. 4,450,836, Cl. 128-127.000.

Goertz, Hans-Helmut: *See*—
Denzinger, Walter; Goertz, Hans-Helmut; Sanner, Axel; and Hartmann, Heinrich, 4,451,582, Cl. 521-38.000.

Goguelin, Michel: *See*—
Vallee, Antoine; and Goguelin, Michel, 4,451,539, Cl. 428-515.000.

Goldsmith, Riley G., to Conoco Inc. Guideline system for positioning subsea equipment. 4,451,177, Cl. 405-195.000.

Gondo, Takeshi: *See*—
Maekawa, Tsukasa; and Gondo, Takeshi, 4,451,662, Cl. 549-462.000.

Gonsalves, Alexander A.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Goode, Robert C. Digital watch magnifying element. 4,451,117, Cl. 350-114.000.

Goodman, Joseph E., to Jofax Industries, Inc. Combination direct-/reverse image copy machine. 4,451,143, Cl. 355-66.000.

Goodrich, Michael J., to Kelsey-Hayes Company. Powder dispensing assembly. 4,450,983, Cl. 222-196.000.

Goralnik, Charles D. Temperature sensitive ballast circuit for a fluorescent lamp. 4,451,767, Cl. 315-309.000.

Gordon, Timothy M.: *See*—
Elgas, Roger J.; and Gordon, Timothy M., 4,451,562, Cl. 435-2.000.

Goring, Joachim E., to Wuelfing, Johanna. Xanthine derivatives, and their use in pharmaceutical compositions. 4,451,449, Cl. 424-253.000.

Gorman, Patrick H., II: *See*—
Burke, Edmund T.; Gorman, Patrick H., II; Henderson, James A., Jr.; and Smith, Nicholas K., 4,451,705, Cl. 179-27.00D.

Goschke, Richard: *See*—
Ferrini, Pier G.; and Goschke, Richard, 4,451,471, Cl. 424-263.000.

Gossling Development Corporation: *See*—
Manzi, Joseph, 4,451,035, Cl. 272-137.000.

Goto, Masana: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Ishiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.

Goto, Satoshi: *See*—
Kinoshita, Akira; Sasaki, Osamu; Sawada, Kiyoshi; and Goto, Satoshi, 4,451,548, Cl. 430-79.000.

Gougeon, Jacques. Fabric made chair for facilitating transportation of a disabled person. 4,450,991, Cl. 224-159.000.

Gould, Francis E.; and Johnston, Christian W., to Tyndale Plains-Hunter, Ltd. Polyurethane quaternary ammonium salts. 4,451,635, Cl. 528-71.000.

Grabbe, Dimitry; Bakermans, Johannes C. W.; Cosmo, Nicola; and Korsunsky, Iosif, to AMP Incorporated. Miniature connector for a circuit board edge. 4,451,818, Cl. 339-75.0MP.

Grabchenko, Anatoly I.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Gracia, Robert F.: *See*—
Fromson, Howard A.; and Gracia, Robert F., 4,451,145, Cl. 355-100.000.

Graco Inc.: *See*—
O'Connell, William F., 4,450,954, Cl. 198-793.000.

Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; Newton, Kevin H.; and Bozzelli, John C., to Diebold Incorporated. Apparatus for retrieving paper money bills presented but not picked up at automatic teller machine bill delivery station. 4,450,978, Cl. 221-13.000.

Grage, Ludger; and Ryseck, Werner, to Siemens Aktiengesellschaft. Test device for determining the extinction value of a laser range finder. 4,451,146, Cl. 356-5.000.

Granatek, Alphonse P.: *See*—
Kaplan, Murray A.; and Granatek, Alphonse P., 4,451,447, Cl. 424-131.000.

Graser, Fritz; and Wickenhaeuser, Gerhard, to BASF Aktiengesellschaft. Conditioning of finely divided crude organic pigments. 4,451,654, Cl. 546-34.000.

Gray, Lawrence H., to Moniteq Ltd. Resonance lamp. 4,451,765, Cl. 315-248.000.

Graziano, Nick. Anti-theft device for automobile taps. 4,450,695, Cl. 70-168.000.

Great Lakes Carbon Corporation: *See*—
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,451,926, Cl. 373-93.000.

Greco, Giovanni: *See*—
Diedrich, Heinz K.; Greco, Giovanni; and Fanti, Domenico, 4,451,735, Cl. 250-352.000.

Green, John D.: *See*—
Odle, Herbert A.; Green, John D.; and Shadwick, Jan, 4,451,875, Cl. 362-297.000.

Green, Kenneth E.; and Talbourdet, John A., to Honeywell Inc. Cryogenic cooler thermal coupler. 4,450,693, Cl. 62-514.00R.

Greenhaw, Cleo; and Smotone, Marvin. Bottom line work piece holders. 4,451,168, Cl. 400-623.000.

Gregory, Kenneth E.: *See*—
Gaunt, John; and Gregory, Kenneth E., 4,450,721, Cl. 73-290.00B.

Gregory, Raymond S., to Medishield Corporation Limited, The. Gas switching device. 4,450,852, Cl. 137-114.000.

Gres, Jean-Pierre; and Icard, Jean-Pierre G., to Societe Anonyme dite: Compagnie Maritime d'Expertises S.A. Arc-welding device used to secure studs on metallic elements underwater. 4,451,723, Cl. 219-98.000.

Gresch, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,451,435, Cl. 422-171.000.

Grey, Roger A., to Atlantic Richfield Company. Preparation of ketones from 1,2-epoxides. 4,451,672, Cl. 568-384.000.

Grice, Donald G.; and Howley, Frank E., to International Business Machines Corp. Data processing system bus for multiple independent users. 4,451,881, Cl. 364-200.000.

Grieg, Jonathan P., to Honeywell Inc. Voltage controlled current source. 4,451,779, Cl. 323-312.000.

Griffin, Robert L.: *See*—
Onken, Donald R.; and Griffin, Robert L., 4,450,828, Cl. 126-343.50A.

Griffin, Robert M.; and Martin, Roy C., to GTE Products Corporation. Long life incandescent tungsten-halogen lamp. 4,451,760, Cl. 313-557.000.

Grigsby, Robert A., Jr.: *See*—
Knifton, John F.; Lin, Jiang-Jen; Grigsby, Robert A., Jr.; and Brader, Walter H., Jr., 4,451,679, Cl. 568-909.000.

Grimm, Gerold; Kemmner, Ulrich; Knapp, Heinrich; and Rose, Klaus, to Robert Bosch GmbH. Device for controlling a flowthrough cross section in a control line. 4,450,866, Cl. 137-625.340.

Grimm, Robert A.: *See*—
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Grinberg, Isaak P.: *See*—
Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.

Grinstead, Robert R., to Dow Chemical Company, The. Iodine adsorption via picolylamine ion exchange resins. 4,451,375, Cl. 210-670.000.

Grode, Gerald A.: *See*—
Geissler, Ulrich C.; Grode, Gerald A.; Stith, William J.; and Williams, Ronald A., 4,451,259, Cl. 604-408.000.

Grossi, Renzo, to Dario Manuli S.p.A.; and F.I.S., s.r.l. Macchinari Per Imballaggi, a part interest. Automatic packaging machine. 4,450,668, Cl. 53-176.000.

Grot, Arnold S., to United Technologies Corporation. Mold having a helix for casting single crystal articles. 4,450,889, Cl. 164-361.000.

Grote, Dace; Grimm, Robert A.; and Norton, Richard V., to Ashland Oil, Inc. Preparation of isobutyryl fluoride. 4,451,670, Cl. 562-606.000.

Gruber, Robert J.; and Knapp, John F., to Xerox Corporation. Conductive single component magnetic toner for use in electronic printing devices. 4,451,837, Cl. 346-153.100.

Gruenberg, Elliot L., to BroadCom, Inc. Communications system and network. 4,451,699, Cl. 179-2.0EB.

Grumman Allied Industries, Inc.: *See*—
Ciocca, Joseph A.; and Knowles, Gregory W., 4,451,334, Cl. 203-11.000.

GSE, Inc.: *See*—
Reinholm, James H.; and Marcinkiewicz, Eugene J., 4,450,727, Cl. 73-862.230.

GTE Atea NV: *See*—
Taylor, Michael G. C.; and Buerman, Marc H. L., 4,451,710, Cl. 179-110.00A.

GTE Automatic Electric Inc.: *See*—
Boeckmann, Eduard F. B., 4,451,706, Cl. 179-81.00R.
Kapral, Christopher W., 4,451,820, Cl. 340-347.0DA.
Neese, Wayne E., 4,451,715, Cl. 200-11.00G.

GTE Laboratories Incorporated: *See*—
McNeill, William H.; and Chen, Yung J., 4,451,123, Cl. 350-386.000.

GTE Products Corporation: *See*—
Griffin, Robert M.; and Martin, Roy C., 4,451,760, Cl. 313-557.000.
Lagos, Costas C., 4,451,757, Cl. 313-489.000.
Stites, Francis H., 4,451,832, Cl. 343-858.000.

Guest, David H.; and Roubaud, Peter R., to Hewlett-Packard Limited. Bus extender circuitry for data transmission. 4,451,886, Cl. 364-200.000.

Guhl, Thomas E.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Guillot, Christian: *See*—
Schneider, Michel; Chevreux, Pierre; and Guillot, Christian, 4,451,568, Cl. 435-181.000.

Gulden, Walter: *See*—
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Gulf Research & Development Company: *See*—
Mitchell, Bruce R.; and Vogel, Roger F., 4,451,355, Cl. 208-113.000.

Gunkel, Werner: *See*—
Sattler, Gunther; Gunkel, Werner; Witzgall, Manfred; and Look, Reinhard, 4,451,365, Cl. 210-198.200.

Gustavus, David C. Portable adjustable roof platform. 4,450,935, Cl. 182-45.000.

Gutter, David H.: *See*—
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Gwozdz, Peter S., to Advanced Micro Devices, Inc. Method for interconnecting metallic layers. 4,451,326, Cl. 156-643.000.

Gygax, Johannes, to ITT Industries, Inc. Brake system antilocking mechanism. 4,451,096, Cl. 303-109.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Static VAR generation for transmission line compensation. 4,451,777, Cl. 323-210.000.

H. B. Fuller Company: *See*—
Clausen, Victor H.; and Asbury, Charles E., 4,451,515, Cl. 428-112.000.

H. Cameron Gardner Ltd.: *See*—
Gardner, Peter C., 4,450,925, Cl. 180-89.100.

Haarmann & Reimer GmbH: *See*—
Gatfield, Ian; and Sand, Theodor, 4,451,565, Cl. 435-117.000.

Haase, Thomas A.: *See*—
Pesa, Frederick A.; and Haase, Thomas A., 4,451,407, Cl. 260-465.400.

Habermann, Wolfgang: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.

Hachmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Buddcn, Renke, to Kali-Chemie Pharma GmbH. Acidiferous 17-normal-pentyl sparteine tartaric and fumaric acid salts pharmaceutical compositions thereof. 4,451,468, Cl. 424-256.000.

Hadhazy, Pal: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Haggar Company: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,451,318, Cl. 156-353.000.
Off, Joseph W. A.; and Early, Judson H., 4,451,319, Cl. 156-353.000.

Hagglund, Tjell-Ake: *See*—
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., 4,451,332, Cl. 162-30.100.

Hahn, Granville J.: *See*—
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., 4,451,586, Cl. 521-88.000.

Hahnel, Thomas, to Messerschmitt-Bolkow-Blohm G.m.b.H. Ram jet engines and rotary gas flow valve therefor. 4,450,679, Cl. 60-251.000.

Haig, David E., to Jacobs, Abe. Precision material filling systems. 4,450,981, Cl. 222-61.000.

Haigh, Daniel H.: *See*—
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Hajime Industries Ltd.: *See*—
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Hake, Kenneth A., to Kent Manufacturing Company, Inc. Self-leveling arrangement for agricultural implement frame. 4,450,917, Cl. 172-328.000.

Hall, Fred W.; and Reteisdorf, Hans-Joachim. Sintered hardmetals. 4,451,292, Cl. 75-238.000.

Hall, John S.; and Phelps, Barry C., to California Interface and Software Limited Partnership. Engraved image identification card with opaque cover layer. 4,451,068, Cl. 283-75.000.

Hall, Stephen T.; Hardiman, Raymond; Johnson, Peter W.; Quarendon, Peter; and Tuffill, Harold W., to International Business Machine Corporation. Digital data display system. 4,451,825, Cl. 340-750.000.

Haliburton Company: *See*—
Bravenec, Frank R., 4,451,790, Cl. 324-351.000.
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Halpern, Peter H.: *See*—
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Hamilton, Steven P. Method of installing a camshaft. 4,450,609, Cl. 29-156.40R.

Hammock, Richard A.: *See*—
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Hammond, Garth D.: *See*—
Buresh, Lloyd V.; Hammond, Garth D.; Koval, Emil J.; and McCormick, Vernon R., 4,451,103, Cl. 339-93.00R.

Hamon-Sobelco, S.A.: *See*—
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Hampel, Werner: *See*—
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Hanaoka, Tadashi; Umezu, Hiroaki; and Shigaraki, Ginichi, to Misawa Homes K.K. Horizontal force resisting building structure and attachment for attaching walls to same. 4,450,659, Cl. 52-167.000.

Handley, Harold: *See*—
Ryston, Ivor; Handley, Harold; Seegmiller, J. Edwin; and Thompson, Linda F., 4,451,570, Cl. 435-240.000.

Hang, Kenneth W.: *See*—
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Hanks, James V., to Horton Manufacturing, Co. Combination friction ring and mount therefor for clutches, brakes and the like. 4,450,947, Cl. 192-107.00R.

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Taguchi, Kiyomi; Hanmyo, Masayuki; and Ishikawa, Masaru, 4,450,894, Cl. 164-484.000.

Hansch, Theodor W.; and Couillaud, Bernard J. Method of and apparatus for measuring optical frequency variations. 4,451,923, Cl. 372-32.000.

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Hirabayashi, Shigeto; Masukawa, Toyoaki; Ishikawa, Wataru; and Harada, Tetsuya, 4,451,561, Cl. 430-619.000.

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Hardiman, Raymond: *See*—
Hall, Stephen T.; Hardiman, Raymond; Johnson, Peter W.; Quarendon, Peter; and Tuffill, Harold W., 4,451,825, Cl. 340-750.000.

Harding, James H., to General Electric Company. Mold device for making plastic articles from resin. 4,451,224, Cl. 425-548.000.

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Harman, Sherman M. Means and method for administering medicinals. 4,451,253, Cl. 604-60.000.

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Barclay, John D.; and Harmon, Rawson B., Jr., 4,451,266, Cl. 44-53.000.

Harms, Jack L.: *See*—
Bujan, Albert F.; and Harms, Jack L., 4,451,255, Cl. 604-157.000.

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Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.
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Buckner, John G.; Lineberry, Cletus E.; and Harris, Jimmy W., 4,450,739, Cl. 83-23.000.

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Frazer, August H.; and Harris, John F., Jr., 4,451,642, Cl. 528-347.000.

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Libertini, Zoltan L.; and Hartel, Edward O., 4,451,200, Cl. 415-110.000.

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Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,451,344, Cl. 204-192.00R.

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Shu, Winston R.; and Hartman, Kathy J., 4,450,911, Cl. 166-263.000.

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Jaconette, Frank C., 4,451,100, Cl. 339-14.00R.
Neuroth, David H.; and Smith, Robert F., Jr., 4,451,305, Cl. 156-49.000.

Hase, Osamu: *See*—
Yamamoto, Satoshi; Hase, Osamu; and Kawata, Tamostu, 4,451,271, Cl. 55-84.000.

Hasegawa, Manshiro: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, 4,450,885, Cl. 164-47.000.

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Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,450,680, Cl. 60-274.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,450,812, Cl. 123-438.000.

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Miyazaki, Tadashi; and Hasegawa, Takao, 4,451,311, Cl. 156-86.000.

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Shibuta, Osamu; Hasegawa, Tetuo; and Ogawa, Jun, 4,451,410, Cl. 260-973.000.

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Sanemitsu, Yuzuru; Shiroshita, Masao; Hashimoto, Shunichi; Katoh, Haruhiko; and Matsumoto, Hiroshi, 4,451,283, Cl. 71-93.000.

Haskel, Inc.: *See*—
Kelly, John W., 4,450,612, Cl. 72-62.000.

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Matsuda, Yoshio; Hata, Masahiko; and Ogihara, Toru, 4,450,694, Cl. 66-193.000.

Hatakeyama, Hidewo: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hidewo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,451,417, Cl. 264-53.000.

Hatanaka, Masato: *See*—
Sato, Hiroki; Nakano, Takao; Hatanaka, Masato; Ohhoshi, Toshio; and Tanaka, Sakae, 4,451,756, Cl. 313-422.000.

Hatanaka, Masayuki; and Kurita, Atsushi, to General Electric Company. Silicone elastomer compositions suitable for ultraviolet ray curing. 4,451,634, Cl. 528-24.000.

Hatcher, Kelsey W.: *See*—
Ream, Norman E., 4,450,837, Cl. 128-201.270.

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Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,451,902, Cl. 365-1.000.

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Hauser, Kurt, to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG. Axial cooling fan for internal combustion engines. 4,451,202, Cl. 416-214.00R.

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Legeai, Gilbert E., 4,450,658, Cl. 52-126.300.

Hax, Jorg: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Guldea, Walter; and Hax, Jorg, 4,451,631, Cl. 526-287.000.

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and a method for manufacturing the same. 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, to Mizuno Corporation. Golf club head of carbon fiber reinforced plastic. 4,451,042, Cl. 273-171.000.
Hayashi, Tatsuo: *See*—
Nishimura, Eiichi; Uchida, Shunsuke; Kitamura, Masao; Saito, Koichi; Ibe, Eishi; and Hayashi, Tatsuo, 4,451,428, Cl. 376-333.000.
Hayashi, Tsutomu: *See*—
Kitamura, Minoru; Soejima, Toshiyuki; Hayashi, Tsutomu; Matsui, Hideo; and Fujisawa, Shigenori, 4,451,293, Cl. 75-257.000.
Hayashi, Yoshimasa, to Nissan Motor Co. Ltd. Internal combustion engine with engine knock sensor. 4,450,709, Cl. 73-35.000.
Hayn, Peter W.: *See*—
Mathewes, Wolfgang; and Hayn, Peter W., 4,451,272, Cl. 55-390.000.
Haynes, Hendrick W. Engine fuel conditioner and monitor. 4,450,820, Cl. 123-514.000.
Heath, Chester A.; and VanDuren, Richard G., to International Business Machines Corporation. Cycle stealing I/O controller with programmable offline mode of operation. 4,451,884, Cl. 364-200.000.
Hecht, Sidney M., to Wofor AG. Biologically active extracts from *Myrcia fallax* (Myrtaceae) Peru and method of obtaining same. 4,451,459, Cl. 424-195.000.
Heckler & Koch GmbH: *See*—
Thevis, Paul, 4,450,751, Cl. 89-129.00B.
Hedman, Gunnar: *See*—
Hedman, Rolf E.; and Hedman, Gunnar, 4,450,830, Cl. 126-450.000.
Hedman, Rolf E.; and Hedman, Gunnar. Solar heat device. 4,450,830, Cl. 126-450.000.
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Silverman, Jerry E.; Frost, John R.; Hegedus, Elizabeth; and Glicksman, Martin, 4,451,490, Cl. 426-553.000.
Heger, Thomas J.: *See*—
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Heilmann, Steven M.; Rasmussen, Jerald K.; and Palensky, Frederick J., to Minnesota Mining and Manufacturing Company. Method of hydrophilizing or hydrophobizing polymers. 4,451,619, Cl. 525-379.000.
Hein, Paul R.: *See*—
Tsao, Jung-Hsien; and Hein, Paul R., 4,451,636, Cl. 528-75.000.
Heinemann, Wilfried; and Rummel, Theodor, to Concast, A.G. Method and apparatus for continuous casting of metallic strands in a closed pouring system. 4,450,892, Cl. 164-467.000.
Heinrich Berndes GmbH: *See*—
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Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Barja D.; and Heinsohn, Howard H., Jr., 4,451,392, Cl. 252-522.00R.
Heinzel, Irving C.: *See*—
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Heiss, John F.; and Kolasinski, Richard, to Diamond Crystal Salt Company. Composite plug for stake-hole of salt blocks, salt block product, and method of using same. 4,451,381, Cl. 252-1.000.
Hemmerle, Clayton J.; and Basinger, Richard A. Surface defining slats and articles utilizing same. 4,450,884, Cl. 160-371.000.
Henderson, James A., Jr.: *See*—
Burke, Edmund T.; Gorman, Patrick H., II; Henderson, James A., Jr.; and Smith, Nicholas K., 4,451,705, Cl. 179-27.00D.
Henkel Corporation: *See*—
Childers, John T., 4,451,382, Cl. 252-8.600.
DiDomenico, Edward, Jr., 4,451,622, Cl. 525-456.000.
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Struve, Alfred; Hill, Frank F.; and Schindler, Joachim, 4,451,564, Cl. 435-55.000.
Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, 4,451,261, Cl. 8-94.220.
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Herbertz, Toni: *See*—
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Herbulot, Jean, to Valeo. Brake with heat shield. 4,450,940, Cl. 188-71.300.
Herd, David P.; and Gibson, Duane E., to Smith International, Inc. Seal. 4,451,047, Cl. 277-26.000.
Herman C. Starck Berlin: *See*—
Floeter, Wilfried; Schoening, Gerhard; and Schroeer, Klaus, 4,451,438, Cl. 423-20.000.
Herper, John C.: *See*—
Stangel, John J.; Herper, John C.; and Rothenberg, Carl, 4,451,831, Cl. 343-374.000.
Herrera-Gutierrez, Jesus, to American Interpac Corporation. Means and methods of making bags with spouts. 4,451,246, Cl. 493-215.000.
Hershberger, David L., to Harris Corporation. Separation correction method and apparatus for plural channel transmission system. 4,451,927, Cl. 381-15.000.
Hesler, Joseph P.: *See*—
Holdsworth, Timothy M.; Hesler, Joseph P.; and DuBois, George W., 4,451,803, Cl. 333-12.000.
Heuer, Dieter; and Schmiedke, Georg, to Elektro-Mechanik GmbH. Protective arrangement for a plug-connected electric motor sealed against pressure, vapors and radiation. 4,451,750, Cl. 310-88.000.
Hewlett, Clarence W., Jr. Magic octahedron. 4,451,039, Cl. 273-153.00S.
Hewlett-Packard Company: *See*—
Leonard, Mark, 4,451,731, Cl. 250-237.0SE.
Palermo, David W.; Ricci, David W.; Marriott, Joe E.; and Heger, Thomas J., 4,451,898, Cl. 364-900.000.
Hewlett-Packard Limited: *See*—
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Fink, Richard R., 4,451,695, Cl. 174-87.000.
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Heynisch, Hinrich, to Siemens Aktiengesellschaft. Flat viewing screen with spacers between support plates and method of producing same. 4,451,759, Cl. 313-495.000.
Hidden Valley Associates, Inc.: *See*—
Phillips, Edward H., 4,451,209, Cl. 417-38.000.
Hidrotronic de Colombia, S.A.: *See*—
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Higgins, Jeremy W.; and Brownlee, Robert, to Brownlee Labs Inc. High pressure seal and coupling. 4,451,364, Cl. 210-198.200.
Higgins, Jeremy W.: *See*—
Brownlee, Robert; and Higgins, Jeremy W., 4,451,363, Cl. 210-198.200.
Higratherm Electric GmbH: *See*—
Dahlberg, Reinhard, 4,451,843, Cl. 357-36.000.
Hilbert, Samuel D.: *See*—
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Hill, Jeffrey A.: *See*—
Graef, Harry T.; Mercer, Scott A.; Hill, Jeffrey A.; Newton, Kevin H.; and Bozzelli, John C., 4,450,978, Cl. 221-13.000.
Hill, John; and Day, Joseph G., to Matthey Rustenburg Refiners (Proprietary) Limited. Recovery of platinum group metals from scrap and residues. 4,451,290, Cl. 75-63.000.
Hill Top Research, Inc.: *See*—
Quisno, Robert A., 4,450,844, Cl. 128-743.000.
Hille, Martin: *See*—
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Hills, Richard E., to Pittsburgh-Des Moines Corporation. Removable condensate collector for elevated water storage facilities. 4,450,855, Cl. 137-312.000.
Hilton-Davis Chemical Co., The: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,451,657, Cl. 548-456.000.
Hinds, Paul M.: *See*—
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Hirabayashi, Shigeto; Masukawa, Toyoaki; Ishikawa, Wataru; and Harada, Tetsuya, to Konishiroku Photo Industry Co., Ltd. Heat-development-type image recording material. 4,451,561, Cl. 430-619.000.
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Electrophotographic α-Si(H) member and process for production thereof. 4,451,547, Cl. 430-128.000.
Hiraki, Shunichi; Kikuchi, Kiyoshi; Yawata, Shigeo; and Miyagawa, Masafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Diffusion of aluminum. 4,451,303, Cl. 148-187.000.
Hiraoka, Kunizo. Apparatus for producing concrete pipes. 4,451,222, Cl. 425-432.000.
Hirata, Kazuo; and Takagi, Masao, to Kubota, Ltd. Apparatus for controlling agricultural tractor. 4,450,927, Cl. 180-330.000.
Hirayama, Chikara: *See*—
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Hirohata, Michio: *See*—
Ikari, Hideo; and Hirohata, Michio, 4,451,129, Cl. 354-477.000.
Hirose, Kengo; and Kudo, Norio, to Japan Radio Company, Ltd. Vacuum fuse having magnetic flux generating means for moving arc. 4,451,813, Cl. 337-17.000.
Hirose, Koichi; and Kondo, Kazuo, to Hitachi, Ltd. Non-linear emphasis circuit. 4,451,746, Cl. 307-494.000.
Hirsch, Jacob, to Hirsch, M. David. Sail line stopper. 4,450,603, Cl. 24-132.00R.
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Hirsch, Jacob, 4,450,603, Cl. 24-132.00R.
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Hitachi Construction Machinery Co., Ltd.: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,451,893, Cl. 364-494.000.
Hitachi, Ltd.: *See*—
Baba, Shirou, 4,451,891, Cl. 364-431.120.
Hattori, Motonobu; Tamuro, Yasuharu; Ishibashi, Akira; and Nandoh, Kenji, 4,451,112, Cl. 318-778.000.
Hirose, Koichi; and Kondo, Kazuo, 4,451,746, Cl. 307-494.000.
Hori, Ryoichi; Kubo, Masaharu; Hashimoto, Norikazu; Nishimatsu, Shigeru; and Itoh, Kiyoo, 4,451,841, Cl. 357-23.600.
Isakozawa, Shigeto, 4,451,737, Cl. 250-311.000.
Ishibashi, Tadashi; Ishida, Masahiko; and Odawara, Yoji, 4,451,567, Cl. 435-170.000.
Kataoka, Fumio; Shoji, Fusaji; Obara, Isao; Yokono, Hitoshi; Isogai, Tokio; and Kojima, Mitumasa, 4,451,551, Cl. 430-270.000.
Miyazawa, Hideo; and Kitamura, Junzo, 4,451,242, Cl. 445-65.000.
Mouri, Yasunori, 4,450,815, Cl. 123-479.000.
Nagase, Hiroshi; Ninomiya, Hisakazu; and Ibori, Satoshi, 4,451,771, Cl. 318-800.000.
Nishimura, Eiichi; Uchida, Shunsuke; Kitamura, Masao; Saito, Koichi; Ibe, Eishi; and Hayashi, Tatsuo, 4,451,428, Cl. 376-333.000.
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Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, 4,451,904, Cl. 365-182.000.
Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, 4,451,752, Cl. 310-186.000.
Takano, Yoshiya; and Hoshi, Yoshikazu, 4,450,813, Cl. 123-450.000.
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.
Yamashita, Katsuji; Umetsu, Hiroshi; Sato, Hirotaka; Matsuoka, Yoshio; and Kida, Kei, 4,451,433, Cl. 422-63.000.
Hitachi Maxell, Ltd.: *See*—
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,451,542, Cl. 429-174.000.
Hitachi Metals, Ltd.: *See*—
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Hitchcock, Lonnie G.; and Flanigan, Richard J. Automatic shaper. 4,450,882, Cl. 144-145.00A.
Hitt, Dale. Lathe tool. 4,450,737, Cl. 82-24.00R.
Hitzman, Donald O., to Phillips Petroleum Company. Enhanced oil recovery process using microorganisms. 4,450,908, Cl. 166-246.000.
Hobbs, Robert N.: *See*—
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Hock, Karl-Ludwig: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.
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Leiby, John J.; Hodge, Malcolm H.; and Larkin, Joseph F., 4,450,995, Cl. 225-2.000.
Hodgson, Sten E.; and Gemra, Richard J., to AT&T Technologies, Inc. Apparatus for splicing electric wires. 4,451,104, Cl. 339-99.00R.
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Diery, Helmut; Wester, Norbert; and Hille, Martin, 4,451,671, Cl. 564-286.000.
Dietz, Erwin; and Munkel, Albert, 4,451,656, Cl. 548-352.000.
Oppitz, Peter; Schulze-Braucks, Manfred; and Tesche, Rolf, 4,451,263, Cl. 8-500.000.
Vertesy, Laszlo; Mracek, Miroslav; Braunitzer, Gerhard; and Aschauer, Heinz, 4,451,455, Cl. 424-177.000.
Walker, Stephen E.; Bedford, Keith; and Eaves, Terence, 4,450,877, Cl. 141-1.000.
Wiezer, Hartmut, 4,451,400, Cl. 260-244.400.
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Hoenstine, James M.; and Ray, Thomas E. Hydroplane apparatus. 4,451,239, Cl. 441-66.000.
Hofer, Gerald: *See*—
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Hoffman, George J., to Litton Systems, Inc. Magnet structure. 4,451,811, Cl. 335-302.000.
Hoffman, Kevin R.: *See*—
Doehler, Joachim; Gattuso, David A.; and Hoffman, Kevin R., 4,450,786, Cl. 118-719.000.
Hoffmann, Helmuth, to Hydrotechnik GmbH. Turbine rotor for a flow meter. 4,451,207, Cl. 416-237.00R.
Hoffmann, Karl-Heinz: *See*—
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Hogg, Grady R., Jr.; and Tanner, Nathan S., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,451,926, Cl. 373-93.000.
Holden, John E.; Eddins, Fred D.; and Kimbrough, Richard W. Action play toy. 4,450,650, Cl. 46-17.000.
Holdstock, Barry C.: *See*—
Atkinson, Ivor B.; and Holdstock, Barry C., 4,451,630, Cl. 526-261.000.
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Green, Kenneth E.; and Talbourdet, John A., 4,450,693, Cl. 62-514.00R.
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Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.
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Shidlovsky, Anatoly K.; Tarasov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.
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Ito, Seitoku; Takeda, Kenji; Inagaki, Mitsuo; and Motoda, Nobuo, to Nippon Soken, Inc. Rotary compressor with clearance between movable vanes and slits of the rotor. 4,451,220, Cl. 418-255.000.
Ito, Takashi: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,042, Cl. 273-171.000.
Ito, Yoshimasa: *See*—
Kikuchi, Akira; Sawano, Susumu; and Ito, Yoshimasa, 4,451,195, Cl. 414-732.000.
Itoh, Hideo; and Agatsuma, Kenji, to Fujitsu Limited. Address buffer circuit with low power consumption. 4,451,745, Cl. 307-475.000.
Itoh, Kiyoo: *See*—
Hori, Ryoichi; Kubo, Masaharu; Hashimoto, Norikazu; Nishimatsu, Shigeru; and Itoh, Kiyoo, 4,451,841, Cl. 357-23.600.
Itoh, Susumu: *See*—
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.
ITT Industries, Inc.: *See*—
Adam, Fritz G., 4,451,744, Cl. 307-297.000.
Boehm, Peter, 4,450,688, Cl. 60-554.000.
Gygax, Johannes, 4,451,096, Cl. 303-109.000.
Kohler, Alfred; and Rachner, Horst, 4,451,768, Cl. 318-443.000.
Ivanov, Eduard E.: *See*—
Dahkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.
Iwagami, Hisao: *See*—
Yasuda, Naohiko; Okutsu, Masaru; Iwagami, Hisao; Nakamiya, Teruaki; and Takase, Ichiro, 4,451,399, Cl. 260-239.100.
Iwaki, Yoshiyuki; Yokota, Mitsuyoshi; and Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Charging generator control system. 4,451,776, Cl. 322-22.000.
Iwasa, Koji: *See*—
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Iyehara, Sadahiro; Masuda, Mitsuya; Inohara, Shizuo; Ueda, Minoru; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Color image display apparatus. 4,451,846, Cl. 358-56.000.
Iyehara, Sadahiro: *See*—
Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; and Yamamoto, Keisuke, 4,451,852, Cl. 358-230.000.
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, to Hitachi Construction Machinery Co., Ltd. Control method and control system for hydrostatic drive system. 4,451,893, Cl. 364-494.000.
J. A. Wilson Display Ltd.: *See*—
Shepherd, Charles G., 4,450,970, Cl. 211-189.000.
Jackson, Mark. Readily portable speaker enclosure. 4,451,711, Cl. 179-146.00E.
Jackson, Mervyn B.: *See*—
Bolto, Brian A.; and Jackson, Mervyn B., 4,451,581, Cl. 521-28.000.
Jackson, William L., to Dunlop Limited. Pneumatic tires. 4,451,313, Cl. 156-132.000.
Jacobs, Abe: *See*—
Haig, David E., 4,450,981, Cl. 222-61.000.
Jaconette, Frank C., to Harvey Hubbell Incorporated. Grounding latch apparatus for electrical connectors. 4,451,100, Cl. 339-14.00R.

Jakobsson, Per-Olof; and Beverskog, Sven, to Flakt Aktiebolag. Method of regulating an outdoor steam condensor and apparatus for performing said method. 4,450,899, Cl. 165-39.000.

Jaliwala, Salim A.: *See*—
Morris, Corydon E.; and Jaliwala, Salim A., 4,450,783, Cl. 123-458.000.

James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,451,277, Cl. 71-36.000.

James River Graphics, Inc.: *See*—
Bennett, Everett W.; and Arfaei, Ahmad, 4,451,550, Cl. 430-176.000.

James, Stephen A., to Honeywell Inc. Electrical capacitor. 4,451,868, Cl. 361-306.000.

Jans, Johannes M., to U.S. Philips Corporation. Method of producing printed circuit boards. 4,451,505, Cl. 427-98.000.

Janssen, Norbert G. L. M., to Stamicarbon B.V. Heat recovery attachment for a heating apparatus. 4,450,901, Cl. 165-47.000.

Japan Electronic Industry Development Association: *See*—
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, 4,451,554, Cl. 430-313.000.

Japan Radio Company, Ltd.: *See*—
Hirose, Kengo; and Kudo, Norio, 4,451,813, Cl. 337-17.000.

Japan Styrene Paper Corporation: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hidewo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,451,417, Cl. 264-53.000.

Jean Walterscheid GmbH: *See*—
Troeder, Christoph; Faber, Manfred; and Seigert, Peter, 4,450,729, Cl. 73-862.340.

Jeffrey, Gaines C.; Cooper, Lance A.; and Whipple, Sharon S., to Dow Chemical Company, The. Removal of hydrogen sulfide from fluid streams with minimum production of solids. 4,451,442, Cl. 423-224.000.

Jeffrey, Louis D. Self supporting mouth speculum for horses, mules, and other animals. 4,450,831, Cl. 128-14.000.

Jeneric Industries, Inc.: *See*—
Cohen, Gordon S., 4,450,957, Cl. 206-220.000.
Prasad, Arun, 4,450,958, Cl. 206-222.000.
Prasad, Arun, 4,451,639, Cl. 420-464.000.

Jennings, James R.: *See*—
Davies, Phineas; Jennings, James R.; and Wolstenholme, Jack, 4,451,683, Cl. 570-224.000.

Jensen, Ole R., to E. R. Squibb & Sons, Inc. Ostomy bag with an adjustable vent. 4,451,258, Cl. 604-333.000.

Jermansen, Torris G.: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,451,673, Cl. 568-454.000.

Jerome, Norman F.: *See*—
Nevitt, Thomas D.; and Jerome, Norman F., 4,451,685, Cl. 585-415.000.

Jessel, Alfred J., to Chevron Research Company. Engine intake valve with heat pipe. 4,450,798, Cl. 123-41.410.

Jetter, Heinz: *See*—
Meyer-Kretschmer, Gustav; Jetter, Heinz; and Toennies, Peter, 4,451,437, Cl. 423-3.000.

Jofax Industries, Inc.: *See*—
Goodman, Joseph E., 4,451,143, Cl. 355-66.000.

Jog-O-Lite, Inc.: *See*—
Kirkley, J. Darrell; and Weaver, Joe C., 4,451,871, Cl. 362-186.000.

John Thomas Batts, Inc.: *See*—
Duester, Everett L., 4,450,639, Cl. 40-322.000.

John Wyeth & Brother Ltd.: *See*—
White, Alan C.; and Wyllie, Michael G., 4,451,465, Cl. 424-251.000.

Johncock, Peter, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Epoxy compounds. 4,451,645, Cl. 528-391.000.

Johne, Hans: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,450,767, Cl. 101-365.000.

Johns Hopkins University, The: *See*—
Kahn, Steven A.; Stewart, Robert L.; and Tolchin, Stephen G., 4,451,827, Cl. 340-825.520.

Johnson, Burnett H., to Exxon Research & Engineering Co. Polymerization catalyst. 4,451,574, Cl. 502-115.000.

Johnson, Clark E., Jr., to Vertimag Systems Corporation. Analog recording system. 4,451,858, Cl. 360-32.000.

Johnson, Douglas M., to Empak Inc. Package. 4,450,960, Cl. 206-334.000.

Johnson, Eugene R.: *See*—
Mower, Morris F.; and Johnson, Eugene R., 4,451,223, Cl. 425-458.000.

Johnson, Glyn: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,451,788, Cl. 324-309.000.

Johnson, Howard L.: *See*—
Berger, Frank M.; DeGraw, Joseph I., Jr.; and Johnson, Howard L., 4,451,474, Cl. 424-266.000.

Johnson, Peter W.: *See*—
Hall, Stephen T.; Hardiman, Raymond; Johnson, Peter W.; Quarendon, Peter; and Tuffill, Harold W., 4,451,825, Cl. 340-750.000.

Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems Inc. Memory controller with interleaved queuing apparatus. 4,451,880, Cl. 364-200.000.

Johnston, Christian W.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,451,635, Cl. 528-71.000.

Jones, Arthur L.; and Seeney, Ronald G., to Scovil, Inc. Continuous casting of stringers for sliding clasp fasteners. 4,451,421, Cl. 264-167.000.

Jones, J. Richard: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Jones, James E.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.

Jordan, Larry T., to Seeq Technology, Inc. Method and device for encoding product and programming information in semiconductors. 4,451,903, Cl. 365-94.000.

Joseph, Joseph P.: *See*—
Dusza, John P.; Joseph, Joseph P.; and Bernstein, Seymour, 4,451,479, Cl. 424-273.00P.

Jothi, David P., to Colgate-Palmolive Company. Detergent tablet. 4,451,386, Cl. 252-135.000.

Jost, Manfred: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,451,314, Cl. 156-148.000.

Jouve, Hubert: *See*—
Gerard, Philippe; Jouve, Hubert; and Madore, Michel, 4,451,500, Cl. 427-38.000.

Joyal Products, Inc.: *See*—
Szantho, Charles F.; and Riordan, Edward D., 4,451,722, Cl. 219-86.250.

Jungkind, Roland: *See*—
Knabel, Walter; Wagner, Ludwig; and Jungkind, Roland, 4,451,059, Cl. 280-632.000.

Jutte, Hans: *See*—
Flocke, Gunter; Jutte, Hans; Linde, Klaus; Klamke, Winfried; and Hampel, Werner, 4,451,176, Cl. 405-146.000.

Kabashima, Katsuhiko: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; Enomoto, Seiji; and Mezawa, Tsutomu, 4,451,908, Cl. 365-222.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Itaya, Kingo; Shibayama, Kimio; Toshima, Shinobu; Ataka, Tatsuaki; and Iwasa, Koji, 4,451,348, Cl. 204-290.00R.

Kabushiki Kaisha Hosakawa Funtai Kogaku Kenkyosho: *See*—
Urayama, Kiyoshi, 4,451,005, Cl. 241-40.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Takahashi, Tomoyuki, 4,451,079, Cl. 296-190.000.

Kabushiki Kaisha Sankyo Seiko Seisakusho: *See*—
Kitamura, Yoshio, 4,450,939, Cl. 185-39.000.

Kabushiki Kaisha Sanshin Seisakusho: *See*—
Yagishita, Aisaburo; Mori, Noboru; Kusumi, Kinshiro; and Tsugi, Yoshio, 4,451,298, Cl. 134-10.000.

Kabushiki Kaisha Sato: *See*—
Sato, Yo; and Kashiwaba, Tadao, 4,451,323, Cl. 156-541.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; Suzuki, Yoshihisa; and Omori, Hiroshi, 4,450,678, Cl. 57-333.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; Suzuki, Yoshihisa; and Omori, Hiroshi, 4,450,678, Cl. 57-333.000.

Kadowaki, Takashi: *See*—
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.

Kadowaki, Toshinori: *See*—
Kawachi, Shoji; Kadowaki, Toshinori; and Yamamoto, Katsutoshi, 4,451,616, Cl. 525-178.000.

Kadziela, Kris: *See*—
Nativi, Larry A.; and Kadziela, Kris, 4,451,523, Cl. 428-209.000.

Kaesz, Herbert D.: *See*—
Porter, Clifford R.; and Kaesz, Herbert D., 4,451,351, Cl. 208-10.000.

Kagamiyama, Rokuro. Rotary piston type fluid machine. 4,451,214, Cl. 418-11.000.

Kahl, William G., Jr.: *See*—
Avery, Ronald G.; and Kahl, William G., Jr., 4,451,733, Cl. 250-342.000.

Kahn, Steven A.; Stewart, Robert L.; and Tolchin, Stephen G., to Johns Hopkins University, The. Local area communication network. 4,451,827, Cl. 340-825.520.

Kaimori, Kenichiro: *See*—
Ichikawa, Iwao; and Kaimori, Kenichiro, 4,451,324, Cl. 156-562.000.

Kaiser, Peter: *See*—
Viertel, Lothar; and Kaiser, Peter, 4,451,076, Cl. 296-97.00K.

Kakeno, Nobuhiko: *See*—
Kinoshita, Takahiko; Kakeno, Nobuhiko; and Miura, Nobuhiro, 4,450,807, Cl. 123-403.000.

Kalama Chemical, Inc.: *See*—
Vitner, Joseph, 4,451,330, Cl. 159-48.200.

Kali-Chemie Pharma GmbH: *See*—
Hachmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Budden, Renke, 4,451,468, Cl. 424-256.000.

Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., to Institu Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR. Treatment of cardio-vascular diseases with 3-(2,2,2-trimethylhydrazinium) propionate dihydrate. 4,451,485, Cl. 424-316.000.

Kamemoto, Kazuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Channel selecting device. 4,451,850, Cl. 358-191.100.

Kamiya, Shigeru: *See*—
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,681, Cl. 60-286.000.
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,682, Cl. 60-286.000.

Kamiyama, Shinichi: *See*—
Yanagawa, Nobuyuki; and Kamiyama, Shinichi, 4,451,139, Cl. 355-15.000.

Kamp, Ewald A., to Union Carbide Corporation. Safety blade for severing stretchable film. 4,450,996, Cl. 225-43.000.

Kanayama, Kenji; Sugi, Hidekuni; Kinkori, Shuzo; and Kawasumi, Kouzi, to Nippondenso Co., Ltd. AC Generator. 4,451,749, Cl. 310-62.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Furukawa, Hisao; and Kato, Yasushi, 4,451,602, Cl. 524-266.000.
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.
Yonezawa, Kazuya; Kira, Kazuaki; Wakabayashi, Hiroshi; and Nagano, Hirosaku, 4,451,621, Cl. 525-426.000.

Kaneko, Yutaka: *See*—
Sugita, Hiroshi; Kawakatsu, Satoshi; and Kaneko, Yutaka, 4,451,558, Cl. 430-546.000.

Kanome, Shinji: *See*—
Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, 4,451,629, Cl. 526-238.230.

Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. Pharmaceutical formulations. 4,451,447, Cl. 424-131.000.

Kapral, Christopher W., to GTE Automatic Electric Incorporated. Charge redistribution integratable D/A convertor. 4,451,820, Cl. 340-347.0DA.

Karasinsky, Oleg L.: *See*—
Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.

Karpati, Egon: *See*—
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.

Kashiwaba, Tadao: *See*—
Sato, Yo; and Kashiwaba, Tadao, 4,451,323, Cl. 156-541.000.

Kashiwabara, Mikio, to Messrs. Muse Mannequin Co., Ltd. Folding rack. 4,450,971, Cl. 211-201.000.

Kast, Michael A.: *See*—
Duval, Eugene F.; Bagshaw, David P.; Kast, Michael A.; Masters, Gilbert M.; and Whitehouse, Harry T., 4,450,868, Cl. 137-625.290.

Kaswinkel, K. D.; and Wynn, M. J., to General Electric Company. Method for removing inorganic particulate solids from battery strip. 4,451,297, Cl. 134-9.000.

Kataoka, Fumio; Shoji, Fusaji; Obara, Isao; Yokono, Hitoshi; Isogai, Tokio; and Kojima, Mitumasa, to Hitachi, Ltd.; and Hitachi Chemical Company. Radiation-sensitive poly(amic acid) polymer composition. 4,451,551, Cl. 430-270.000.

Kato, Hiroaki: *See*—
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, 4,451,554, Cl. 430-313.000.

Kato, Hiroshi: *See*—
Otani, Junji; Ikenoya, Yasuo; and Kato, Hiroshi, 4,450,684, Cl. 60-290.000.

Kato, Katsunori: *See*—
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,451,559, Cl. 430-552.000.

Kato, Kiichi: *See*—
Yanagida, Tuneo; and Kato, Kiichi, 4,451,863, Cl. 360-114.000.

Kato, Kiminari, to NGK Insulators, Ltd. Low thermal expansion ceramic article. 4,451,516, Cl. 428-116.000.

Kato, Yasushi: *See*—
Furukawa, Hisao; and Kato, Yasushi, 4,451,602, Cl. 524-266.000.

Kato, Yoshiaki, to Mita Industrial Co., Ltd. Laminated photosensitive plate for electrophotography and process for preparation thereof. 4,451,549, Cl. 430-134.000.

Katoh, Haruhiko: *See*—
Sanemitsu, Yuzuru; Shiroshita, Masao; Hashimoto, Shunichi; Katoh, Haruhiko; and Matsumoto, Hiroshi, 4,451,283, Cl. 71-93.000.

Katz, Harry, to Vinyl Improvement Products Company. Interlocking building siding. 4,450,665, Cl. 52-522.000.

Kaufman, Jeanie F.: *See*—
Cerceo, Chris A.; Kaufman, Jeanie F.; and Kaufman, Martin H., 4,450,849, Cl. 132-89.000.

Kaufman, Martin H.: *See*—
Cerceo, Chris A.; Kaufman, Jeanie F.; and Kaufman, Martin H., 4,450,849, Cl. 132-89.000.

Kaufman, Richard A. Method for increasing the sensitivity of assays. 4,451,563, Cl. 435-21.000.

Kaule, Wittich; and Stenzel, Gerhard, to Gao Gesellschaft fur Automation und Organisation mbH. Security paper with authenticity features in the form of substances luminescing only in the invisible region of the optical spectrum and process for testing the same. 4,451,521, Cl. 428-199.000.

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Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; Suzuki, Yoshihisa; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Air nozzle utilized for fasciated yarn spinning. 4,450,678, Cl. 57-333.000.

Kawabuchi, Katsuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Mask structure for X-ray lithography and method for manufacturing the same. 4,451,544, Cl. 430-5.000.

Kawachi, Shoji; Kadowaki, Toshinori; and Yamamoto, Katsutoshi, to Daikin Kogyo Co., Ltd. Process for preparation of filter-containing polytetrafluoroethylene fine powder. 4,451,616, Cl. 525-178.000.

Kawagoe, Michio: *See*—
Ando, Ken; Tanaka, Masaaki; and Kawagoe, Michio, 4,450,824, Cl. 123-569.000.

Kawahara, Fumio; Takahashi, Masanori; and Kumagai, Katsuyoshi, to Pioneer Electronic Corporation; and Mogami Denki Kabushiki Kaisha. Flame-retarded acoustic diaphragm. 4,451,609, Cl. 524-708.000.

Kawai, Hisasi: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; and Kawai, Hisasi, 4,450,825, Cl. 123-569.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,450,746, Cl. 84-1.240.

Kawai, Shizuo: *See*—
Furuhashi, Yasuhiro; Ishikawa, Naozi; and Kawai, Shizuo, 4,450,819, Cl. 123-502.000.
Ibuki, Noritaka; and Kawai, Shizuo, 4,450,817, Cl. 123-501.000.

Kawakami, Yukichika: *See*—
Shiiki, Zenya; and Kawakami, Yukichika, 4,451,640, Cl. 528-265.000.

Kawakatsu, Satoshi: *See*—
Sugita, Hiroshi; Kawakatsu, Satoshi; and Kaneko, Yutaka, 4,451,558, Cl. 430-546.000.

Kawamura, Takao; and Yoshida, Masazumi, to Minolta Camera Kabushiki Kaisha; Kawamura, Takao; and Kyocera Corporation. Photosensitive member. 4,451,546, Cl. 430-69.000.

Kawanabe, Yoshihiro: *See*—
Nishioka, Akira; and Kawanabe, Yoshihiro, 4,451,800, Cl. 330-261.000.

Kawasaki, Kunio: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.

Kawasaki Steel Corporation: *See*—
Nemoto, Hiroshi; Miyachi, Kazuaki; and Komoda, Akira, 4,451,345, Cl. 204-206.000.

Kawasumi, Kouzi: *See*—
Kanayama, Kenji; Sugi, Hidekuni; Kinkori, Shuzo; and Kawasumi, Kouzi, 4,451,749, Cl. 310-62.000.

Kawata, Tamostu: *See*—
Yamamoto, Satoshi; Hase, Osamu; and Kawata, Tamostu, 4,451,271, Cl. 55-84.000.

Kawazoe, Shiyouzou; Ueda, Zenichi; Sugimoto, Toshihiko; and Moriuchi, Takahiko, to Nitto Electric Industrial Co., Ltd. Products having compound membrane. 4,451,525, Cl. 428-213.000.

Kay, Nicholas W., to Burroughs Corporation. Glass composition and gas-filled display panel incorporating the glass as an insulating layer. 4,451,761, Cl. 313-586.000.

Keats, Kevin; and Kurelek, John, to Koehring Canada Limited. Integral heel tree length grapple. 4,451,194, Cl. 414-731.000.

Kekesi, Krisztina: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Keller, Roger H.: *See*—
Matthews, John B.; and Keller, Roger H., 4,450,962, Cl. 206-447.000.

Kellner, Phillip R.: *See*—
Gamson, Alan R.; and Kellner, Phillip R., 4,451,552, Cl. 430-302.000.

Kelly, John W., to Haskel, Inc. Swaging apparatus for radially expanding tubes to form joints. 4,450,612, Cl. 72-62.000.

Kelsey-Hayes Company: *See*—
Goodrich, Michael J., 4,450,983, Cl. 222-196.000.

KemaNord AB: *See*—
Andersson, Bengt, 4,451,585, Cl. 521-59.000.

Kemler, Marc; Coppens, Christian; and Billot, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Spare subscriber terminal apparatus. 4,451,708, Cl. 179-98.000.

Kemmner, Ulrich: *See*—
Grimm, Gerold; Kemmner, Ulrich; Knapp, Heinrich; and Rose, Klaus, 4,450,866, Cl. 137-625.340.

Kempner, Marvin A.; and Elder, Robert E., to M. A. Kempner, Inc. Automatic audience survey system. 4,451,700, Cl. 179-2.0AS.

Kennedy, Robert J., Jr.: *See*—
Kennedy, Robert J., Sr.; Kennedy, Robert J., Jr.; and Ramachandran, Sundaresan, 4,451,537, Cl. 428-391.000.

Kennedy, Robert J., Sr.; Kennedy, Robert J., Jr.; and Ramachandran, Sundaresan, to Union Carbide Corporation. Asbestos composition having organo-silane coating. 4,451,537, Cl. 428-391.000.

Kent Manufacturing Company, Inc.: *See*—
Hake, Kenneth A., 4,450,917, Cl. 172-328.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Hartwig, Heinz, 4,451,872, Cl. 362-251.000.
Kerr-McGee Chemical Corporation: *See*—
Magyar, John C., 4,451,511, Cl. 428-35.000.
Kerr, Stuart R., III; and Meshirer, Milton, to Beacon Chemical Company, Inc. Coated polystyrene foams and compositions and processes for the production thereof. 4,451,529, Cl. 428-319.300.
Keshi, Akizo; and Kodama, Katsuhisa, to Takeda Chemical Industries, Ltd. Polyurethane foam and its production. 4,451,587, Cl. 521-171.000.
Ketcham, William P.: *See*—
Selwyn, Stephen; and Ketcham, William P., 4,451,158, Cl. 368-63.000.
Keuchel, Herbert W. Syntactic phase extrusion. 4,451,420, Cl. 264-167.000.
Keyes, Marion A., IV; and Salmen, Richard A., deceased (by Salmen, Marie P., executrix), to Babcock & Wilcox Company, The. Water level gauge with fault detector. 4,450,722, Cl. 73-293.000.
Keyser, William L.: *See*—
Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., 4,451,488, Cl. 426-89.000.
Khac, Bi L., to Atlantic Richfield Company. Miscible polyblend and molded article produced therefrom. 4,451,617, Cl. 525-203.000.
Khosropour, Mostafa M.; and Learn, Thomas C., to Nelson Industries, Inc. Heat recovery muffler. 4,450,932, Cl. 181-211.000.
Khristov, Vladimir A.: *See*—
Shibanov, Dmitry A.; Onufriev, Inokenty A.; Khristov, Vladimir A.; and Sergeev, Evgeny A., 4,450,888, Cl. 164-183.000.
Kida, Kei: *See*—
Yamashita, Katsuji; Umetsu, Hiroshi; Sato, Hirotaka; Matsuoka, Yoshio; and Kida, Kei, 4,451,433, Cl. 422-63.000.
Kikuchi, Akira; Sawano, Susumu; and Ito, Yoshimasa, to Tokico Ltd. Arm for a program controlled manipulator. 4,451,195, Cl. 414-732.000.
Kikuchi, Hiroto: *See*—
Miura, Toshikatu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,451,518, Cl. 428-137.000.
Kikuchi, Kiyoshi: *See*—
Hiraki, Shunichi; Kikuchi, Kiyoshi; Yawata, Shigeo; and Miyagawa, Masafumi, 4,451,303, Cl. 148-187.000.
Kilian, Ernst A., to U.S. Philips Corporation. Circuit arrangement with controllable transfer characteristic at higher frequencies. 4,451,795, Cl. 330-107.000.
Killion, Mead C., to Industrial Research Products, Inc. Microphone with stepped response. 4,450,930, Cl. 181-158.000.
Kimberly-Clark Corporation: *See*—
Morman, Michael T.; and Wisneski, Tony J., 4,451,589, Cl. 523-124.000.
Kimbrough, Richard W.: *See*—
Holden, John E.; Eddins, Fred D.; and Kimbrough, Richard W., 4,450,650, Cl. 46-17.000.
Kimmel, Edward R.: *See*—
Cheney, Richard F.; Bansal, Anil; and Kimmel, Edward R., 4,450,724, Cl. 73-432.00R.
Kindlmann, Peter J.: *See*—
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,450,890, Cl. 164-452.000.
King Industrial Products Co., Inc.: *See*—
King, Joseph S., 4,450,708, Cl. 72-481.000.
King, Joseph S., to King Industrial Products Co., Inc. Universal, adjustable bending form for shaping electrical windings. 4,450,708, Cl. 72-481.000.
Kinkori, Shuzo: *See*—
Kanayama, Kenji; Sugi, Hidekuni; Kinkori, Shuzo; and Kawasumi, Kouzi, 4,451,749, Cl. 310-62.000.
Kinoshita, Akira; Sasaki, Osamu; Sawada, Kiyoshi; and Goto, Satoshi, to Konishiroku Photo Industry Co., Ltd. Electrophotographic photoreceptor. 4,451,548, Cl. 430-79.000.
Kinoshita, Takahiko; Kakeno, Nobuhiko; and Miura, Nobuhiro, to Toyota Jidosha Kabushiki Kaisha. Suction air throttling device of diesel engine. 4,450,807, Cl. 123-403.000.
Kioritz Corporation: *See*—
Fukuoka, Takashi; Nagao, Yoshiaki; and Tanaka, Hiroyuki, 4,450,933, Cl. 181-229.000.
Kippax, John W.: *See*—
Bradley, Michael W.; Hiles, Andrew G.; and Kippax, John W., 4,451,677, Cl. 568-881.000.
Kira, Kazuaki: *See*—
Yonezawa, Kazuya; Kira, Kazuaki; Wakabayashi, Hiroshi; and Nagano, Hirosaku, 4,451,621, Cl. 525-426.000.
Kircher, Morton S., to Olin Corporation. Membrane-electrode pack alkali chlorine cell. 4,451,346, Cl. 204-228.000.
Kirkemo, Curtis L.: *See*—
Flentge, Charles A.; and Kirkemo, Curtis L., 4,451,652, Cl. 544-229.000.
Kirkendall, Richard D.; Drysdale, William H.; and Kokinakis, Louis D., to United States of America, Army. Pivot ring for a discarding sabot. 4,450,770, Cl. 102-523.000.
Kirkley, J. Darrell; and Weaver, Joe C., to Jog-O-Lite, Inc. Safety light or the like with high current drive. 4,451,871, Cl. 362-186.000.
Kirschner, Thomas F., to RCA Corporation. Record extraction mechanism for disc player. 4,451,912, Cl. 369-77.200.
Kis France: *See*—
Thebault, Claude, 4,451,141, Cl. 355-28.000.
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha; and Japan Electronic Industry Development Association. Method of forming thin-film pattern. 4,451,554, Cl. 430-313.000.
Kishimoto, Shinzo, to Fuji Photo Film Co., Ltd. Color photographic processing apparatus including a reverse osmosis apparatus. 4,451,132, Cl. 354-324.000.
Kitamura, Junzo: *See*—
Miyazawa, Hideo; and Kitamura, Junzo, 4,451,242, Cl. 445-65.000.
Kitamura, Masao: *See*—
Nishimura, Eiichi; Uchida, Shunsuke; Kitamura, Masao; Saito, Koichi; Ibe, Eishi; and Hayashi, Tatsuo, 4,451,428, Cl. 376-333.000.
Kitamura, Minoru; Soejima, Toshiyuki; Hayashi, Tsutomu; Matsui, Hideo; and Fujisawa, Shigenori, to Quiqley Company, Inc. Slag-forming agent and process for producing the agent. 4,451,293, Cl. 75-257.000.
Kitamura, Yoshio, to Kabushiki Kaisha Sankyo Seiko Seisakusho. Music box operation stopping mechanism. 4,450,939, Cl. 185-39.000.
Kitt, Robert A.; and Wirts, Harold L., to Mossberg Industries, Inc. Wire storing and dereeling apparatus. 4,451,014, Cl. 242-128.000.
Klamke, Winfried: *See*—
Flocke, Gunter; Jutte, Hans; Linde, Klaus; Klamke, Winfried; and Hampel, Werner, 4,451,176, Cl. 405-146.000.
Klee, David J.; and Nelson, Peter C., to Air Products and Chemicals, Inc. Temperature actuated valve and phase separation method. 4,451,002, Cl. 236-101.00R.
Klemarczyk, Philip T., to International Flavors & Fragrances Inc. Substituted methyl isopropyl oxocyclohexane derivatives, organoleptic uses thereof and process for preparing same. 4,451,403, Cl. 260-396.00N.
Kliewer, Wayne R.: *See*—
Lemanski, Michael F.; and Kliewer, Wayne R., 4,451,579, Cl. 502-306.000.
Kling, Miguel. Fume exhauster device. 4,450,756, Cl. 98-115.00R.
Klockner-Humboldt-Deutz AG: *See*—
Kotauschek, Walter, 4,450,800, Cl. 123-193.0CH.
Kloppsteck, Gerd, to Heinrich Berndes GmbH. Frying pan lid. 4,451,156, Cl. 368-10.000.
Klose, George J.; Rosenthal, Janice E.; Schneider, Thomas G.; and Schroeder, Robert F., to Mattel, Inc. Interactive communicating toy figure device. 4,451,911, Cl. 369-31.000.
Klun, Robert T.; and Regulski, Thomas W., to Dow Chemical Company, The. Preparation of acrylate esters from vinyl halides and organic carbonates. 4,451,667, Cl. 560-207.000.
Knabel, Walter; Wagner, Ludwig; and Jungkind, Roland, to MARK-ER-Patentverwertungsgesellschaft mbH. Heelholder for safety ski bindings. 4,451,059, Cl. 280-632.000.
Knapp, Heinrich: *See*—
Grimm, Gerold; Kemmner, Ulrich; Knapp, Heinrich; and Rose, Klaus, 4,450,866, Cl. 137-625.340.
Knapp, John F.: *See*—
Gruber, Robert J.; and Knapp, John F., 4,451,837, Cl. 346-153.100.
Knifton, John F.; Lin, Jiang-Jen; Grigsby, Robert A., Jr.; and Brader, Walter H., Jr., to Texaco Inc. Alcohols and aldehydes prepared from olefins and synthesis gas. 4,451,679, Cl. 568-909.000.
Knifton, John F., to Texaco Inc. Alcohols prepared from olefins and synthesis gas. 4,451,680, Cl. 568-909.000.
Knipsm "Zavodproekt": *See*—
Popov, Marin A.; and Georgiev, Todor G., 4,451,294, Cl. 106-75.000.
Knittel, Helmut: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, to Carl Freudenberg, Firma. Method for the manufacture of a fluffy, light-weight, soft nonwoven fabric. 4,451,314, Cl. 156-148.000.
Knoke, Jurgen: *See*—
Tecl, Bohuslav; Fahrbach, Erich; Knoke, Jurgen; and Assent, Hans C., 4,451,520, Cl. 428-198.000.
Knops, Hans-Joachim; Babczinski, Peter; Eue, Ludwig; and Schmidt, Robert, to Bayer Aktiengesellschaft. Herbicidally active novel hetero-substituted pyrid-4-one derivatives. 4,451,282, Cl. 71-92.000.
Knorr-Bremse GmbH: *See*—
Beckmann, Heinrich; Ottersbach, Jens; Roider, Willibald; and Saumweber, Eckart, 4,451,889, Cl. 364-426.000.
Knorr, Volker: *See*—
Schupphaus, Herbert; and Knorr, Volker, 4,451,091, Cl. 299-43.000.
Knothe, Eric: *See*—
Behrend, Lothar; Knothe, Eric; Melcher, Franz-Josef; and Ober, Jurgen, 4,450,924, Cl. 177-212.000.
Knothe, Erich: *See*—
Behrend, Lothar; Knothe, Erich; Melcher, Franz-Josef; and Ober, Jurgen, 4,450,923, Cl. 177-212.000.
Knott, Jack E., II: *See*—
Odorzynski, Thomas W.; and Knott, Jack E., II, 4,451,599, Cl. 524-169.000.
Knowles, Gregory W.: *See*—
Ciocca, Joseph A.; and Knowles, Gregory W., 4,451,334, Cl. 203-11.000.
Kobayashi Institute of Physical Research: *See*—
Yamashita, Mitsuyasu; Igarashi, Hiroshi; and Koga, Shosuke, 4,450,931, Cl. 181-198.000.

Kobayashi, Kazuo: *See*—
Furuta, Mamoru; Maeno, Yoshio; and Kobayashi, Kazuo, 4,451,418, Cl. 264-63.000.
Kobayashi, Nobuyuki: *See*—
Moriyama, Eiichi; and Kobayashi, Nobuyuki, 4,450,808, Cl. 123-417.000.
Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, to Toyo Seikan Kaisha Ltd. Side seam-coated welded cans and process for preparation thereof. 4,451,506, Cl. 427-239.000.
Kobayashi, Seishichi: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.
Kobayashi, Setsuo; Beppu, Kazuo; Shimizu, Hiroshi; Ogawa, Satoshi; and Kotani, Ryotaro, to Toyo Boseki Kabushiki Kaisha. Stable enzyme composition. 4,451,569, Cl. 435-188.000.
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Substituted benzene derivatives having at least one benzene ring substituted by 3,3,3-trifluoropropyl group and process for their production. 4,451,674, Cl. 568-639.000.
Koch Process Systems, Inc.: *See*—
O'Brien, John V., 4,451,274, Cl. 62-17.000.
Kocher, Erich J., to Vilter Manufacturing Corporation. Means for releasably securing hand-wheel to valve spindle. 4,450,856, Cl. 137-315.000.
Kodama, Katsuhisa: *See*—
Keshi, Akizo; and Kodama, Katsuhisa, 4,451,587, Cl. 521-171.000.
Kodera, Masao; and Akita, Shigeyuki, to Nippon Soken, Inc. Ultrasonic wave distance detection system. 4,451,909, Cl. 367-99.000.
Koehler, Gerard, to La Telemecanique Electrique. Electromagnet equipped with a moving system including a permanent magnet and designed for monostable operation. 4,451,808, Cl. 335-229.000.
Koehring Canada Limited: *See*—
Keats, Kevin; and Kurelek, John, 4,451,194, Cl. 414-731.000.
Koepke, Gunther: *See*—
Dolezalek, Friedrich; Koepke, Gunther; and Rendelmann, Ulrich, 4,451,497, Cl. 427-39.000.
Koga, Shosuke: *See*—
Yamashita, Mitsuyasu; Igarashi, Hiroshi; and Koga, Shosuke, 4,450,931, Cl. 181-198.000.
Koharagi, Haruo: *See*—
Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, 4,451,752, Cl. 310-186.000.
Kohler, Alfred; and Rachner, Horst, to ITT Industries, Inc. Windshield wiper control circuit. 4,451,768, Cl. 318-443.000.
Koinuma, Hirosi, to Pioneer Electronic Corporation. Power amplifier. 4,451,802, Cl. 330-297.000.
Koivunen, Erkki A.; and Sherman, James F., to General Motors Corporation. Planetary transmission with a spring applied centrifugally sensitive clutch. 4,450,735, Cl. 74-781.00R.
Kojima, Mitumasa: *See*—
Kataoka, Fumio; Shoji, Fusaji; Obara, Isao; Yokono, Hitoshi; Isogai, Tokio; and Kojima, Mitumasa, 4,451,551, Cl. 430-270.000.
Kojima, Tadashi: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,451,920, Cl. 371-40.000.
Kokinakis, Louis D.: *See*—
Kirkendall, Richard D.; Drysdale, William H.; and Kokinakis, Louis D., 4,450,770, Cl. 102-523.000.
Kolasinski, Richard: *See*—
Heiss, John F.; and Kolasinski, Richard, 4,451,381, Cl. 252-1.000.
Kolecki, Jerzy. Propeller. 4,451,208, Cl. 416-237.000.
Kollar, Arpad: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.00R.
Kollmorgen Technologies Corporation: *See*—
Burr, Robert P., 4,450,623, Cl. 29-850.000.
Komatsu, Shigeru; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Polysilicon emitter and base contacts separated by lightly doped poly separator. 4,451,844, Cl. 357-59.000.
Komatsu, Toshiyuki: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,451,547, Cl. 430-128.000.
Komoda, Akira: *See*—
Nemoto, Hiroshi; Miyachi, Kazuaki; and Komoda, Akira, 4,451,345, Cl. 204-206.000.
Komori, Kazuhiro: *See*—
Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, 4,451,904, Cl. 365-182.000.
Komori Printing Machinery Co., Ltd.: *See*—
Inomata, Takehiro; and Oyabu, Nobuya, 4,450,766, Cl. 101-183.000.
Konagaya, Masahiko, to Konan Camera Research Institute. Relation density calculation system. 4,451,855, Cl. 358-289.000.
Konan Camera Research Institute: *See*—
Konagaya, Masahiko, 4,451,855, Cl. 358-289.000.
Kondo, Kazuo: *See*—
Hirose, Koichi; and Kondo, Kazuo, 4,451,746, Cl. 307-494.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Fukuchi, Masakazu; Oishi, Keiji; and Yamazaki, Yoshio, 4,451,134, Cl. 355-3.0DD.
Hirabayashi, Shigeto; Masukawa, Toyoaki; Ishikawa, Wataru; and Harada, Tetsuya, 4,451,561, Cl. 430-619.000.
Kinoshita, Akira; Sasaki, Osamu; Sawada, Kiyoshi; and Goto, Satoshi, 4,451,548, Cl. 430-79.000.
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,451,559, Cl. 430-552.000.
Sugita, Hiroshi; Kawakatsu, Satoshi; and Kaneko, Yutaka, 4,451,558, Cl. 430-546.000.
Kopnicky, Robert J., to Bethlehem Steel Corp. Impact-actuated gripping tool. 4,450,736, Cl. 81-463.000.
Kopp, Walter; and Saalmueller, Karl-Heinz, to Siemens Aktiengesellschaft. Device for removing the developer mix from a developing station. 4,451,133, Cl. 355-3.0DD.
Kormoczy, Peter: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.
Korsunsky, Iosif: *See*—
Grabbe, Dimitry; Bakermans, Johannes C. W.; Cosmo, Nicola; and Korsunsky, Iosif, 4,451,818, Cl. 339-75.0MP.
Kosa, Yasunobu: *See*—
Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, 4,451,904, Cl. 365-182.000.
Koshiyama, Hideo; Sakai, Fumihide; and Ohkuma, Hiroaki, to Bristol-Myers Company. Antitumor antibacterial agents. 4,451,456, Cl. 424-177.000.
Koszeghy, Peter: *See*—
Veisz, Gyorgy; David, Gabor; Koszeghy, Peter; and Szekely, Lajos, 4,451,804, Cl. 333-177.000.
Kotani, Ryotaro: *See*—
Kobayashi, Setsuo; Beppu, Kazuo; Shimizu, Hiroshi; Ogawa, Satoshi; and Kotani, Ryotaro, 4,451,569, Cl. 435-188.000.
Kotauschek, Walter, to Klockner-Humboldt-Deutz AG. Light metal cylinder head for internal combustion engine. 4,450,800, Cl. 123-193.0CH.
Kotek, Alfred J.: *See*—
Farley, Wilbur H.; Kotek, Alfred J.; and Carlson, John H., 4,451,098, Cl. 308-201.000.
Kotlyar, Anatoly M.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.
Kouno, Kageaki: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,451,401, Cl. 260-245.20T.
Kovacs, Gabor: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.
Kovacs, Tibor: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.00R.
Koval, Emil J.: *See*—
Buresh, Lloyd V.; Hammond, Garth D.; Koval, Emil J.; and McCormick, Vernon R., 4,451,103, Cl. 339-93.00R.
Kovalenko, Sergei S.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.
Kovarik, Richard F., to Industrial Electronics Service Co. Tester for remote controlled radio systems. 4,451,712, Cl. 179-175.30R.
Kowalski, Jerome R., to Mohasco Corporation. Headrest for a reclining chair. 4,451,081, Cl. 297-61.000.
Kozak, Henry A.; and Liu, Tony Y., to Mobil Oil Corporation. Two-component high solids coating for rusty steels. 4,451,591, Cl. 523-177.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Mathewes, Wolfgang; and Hayn, Peter W., 4,451,272, Cl. 55-390.000.
Krahn, Margot: *See*—
Riesenberg, Horst; and Krahn, Margot, 4,451,126, Cl. 350-520.000.
Kraiss, Gabor: *See*—
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.
Krakat, Hans: *See*—
Bruhnke, Ulrich; Christoph, Bernd; Harloff, Bernd; and Krakat, Hans, 4,451,077, Cl. 296-185.000.
Kramer, Gordon: *See*—
Oh, Chan S.; and Kramer, Gordon, 4,451,122, Cl. 350-334.000.
Kramer, Wolfgang: *See*—
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.
Krampe & Co Fertigung in Bergbaubedarf GmbH: *See*—
Best, Gerd; and Weikert, Norbert B., 4,451,092, Cl. 299-81.000.
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, to BASF Aktiengesellschaft. Preparation of blue iron hexacyanoferrate-III pigments, and the pigments obtained. 4,451,339, Cl. 204-91.000.
Krasnoff, Eugene L.; and Lindeboom, Herman, to Ingersoll-Rand Company. Hydraulic reciprocating machines. 4,450,920, Cl. 173-80.000.

Krause, Charles J., to NI Industries, Inc. Composite fiber reinforced member and method. 4,451,528, Cl. 428-287.000.

Krause, James J.: *See—*
Thayer, David J.; Krause, James J.; and Welk, John R., 4,451,824, Cl. 340-720.000.

Krauthausen, Edmund: *See—*
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,451,475, Cl. 424-270.000.

Kresge, James S.: *See—*
Sakshaug, Eugene C.; and Kresge, James S., 4,451,815, Cl. 338-21.000.

Kroll, Hartmut: *See—*
Christ, Richard; and Kroll, Hartmut, 4,451,739, Cl. 250-506.100.

Krost, Manfred: *See—*
Schaeffler, Georg; Spiess, Karl; Heyne, Jurgen E.; and Krost, Manfred, 4,450,704, Cl. 72-356.000.

Kubo, Masaharu: *See—*
Hori, Ryoichi; Kubo, Masaharu; Hashimoto, Norikazu; Nishimatsu, Shigeru; and Itoh, Kiyoo, 4,451,841, Cl. 357-23.600.

Kubota, Ltd.: *See—*
Hirata, Kazuo; and Takagi, Masao, 4,450,927, Cl. 180-330.000.

Kubota, Yuichi: *See—*
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,451,531, Cl. 428-329.000.

Kudo, Norio: *See—*
Hirose, Kengo; and Kudo, Norio, 4,451,813, Cl. 337-17.000.

Kuhl, Ulrich: *See—*
Hachmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Budden, Renke, 4,451,468, Cl. 424-256.000.

Kuhle, Engelbert: *See—*
Dickore, Karlfried; and Kuhle, Engelbert, 4,451,406, Cl. 260-465.00D.

Kuipers, Johannes: *See—*
Dolman, Hendrik; and Kuipers, Johannes, 4,451,660, Cl. 549-63.000.

Kumadaki, Itsumaro: *See—*
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,451,674, Cl. 568-639.000.

Kumagai, Katsuyoshi: *See—*
Kawahara, Fumio; Takahashi, Masanori; and Kumagai, Katsuyoshi, 4,451,609, Cl. 524-708.000.

Kume, Ketsuke: *See—*
Yui, Ryosuki; Kume, Ketsuke; Hashi, Masaaki; and Niikura, Junji, 4,451,422, Cl. 264-178.00R.

Kummer, Joseph T.: *See—*
Dzieciuch, Matthew A.; Wroblowa, Halina S.; and Kummer, Joseph T., 4,451,543, Cl. 429-206.000.

Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, to Nippon Soken, Inc. Speed control method and apparatus for automotive vehicles. 4,451,688, Cl. 364-426.000.

Kuraray Co., Ltd.: *See—*
Akagi, Takao; Yamaguchi, Shinji; Maeda, Katsura; and Yamamoto, Kazuo, 4,451,534, Cl. 428-372.000.

Kurashima, Hideo: *See—*
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.

Kurata, Masami: *See—*
Moriguchi, Harukiko; Kurata, Masami; and Ohmori, Takashi, 4,451,853, Cl. 358-281.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujimaki, Hiroto; Ajima, Shigetoshi; and Watanabe, Kazuhiro, 4,451,590, Cl. 523-155.000.
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,451,674, Cl. 568-639.000.
Okuda, Kensuke; Nagai, Hirosi; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, 4,451,235, Cl. 433-201.000.
Shiiki, Zenya; and Kawakami, Yukichika, 4,451,640, Cl. 528-265.000.
Yoshikumi, Chikao; Sakurai, Katsuo; Omura, Yoshio; Nohara, Mayumi; Ando, Takao; and Motokawa, Isamu, 4,451,457, Cl. 424-180.000.

Kurelek, John: *See—*
Keats, Kevin; and Kurelek, John, 4,451,194, Cl. 414-731.000.

Kurherr Motoren A.G.: *See—*
Kurherr, Waldemar H., 4,451,219, Cl. 418-138.000.

Kurherr, Waldemar H., to Kurherr Motoren A.G. Valveless bi-chamber rotary steam engine with turbine effect. 4,451,219, Cl. 418-138.000.

Kurita, Atsushi: *See—*
Hatanaka, Masayuki; and Kurita, Atsushi, 4,451,634, Cl. 528-24.000.

Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,451,688, Cl. 585-524.000.

Kuroshima, Hiroshi: *See—*
Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.

Kurt Lachenmeier ApS: *See—*
Lachenmeier, Kurt; and Simonson, Peter, 4,451,233, Cl. 432-224.000.

Kusumi, Kinshiro: *See—*
Yagishita, Aisaburo; Mori, Noboru; Kusumi, Kinshiro; and Tsugi, Yoshio, 4,451,298, Cl. 134-10.000.

Kutowy, Oleh: *See—*
Tweddle, Thomas A.; Thayer, William L.; Kutowy, Oleh; and Sourirajan, Srinivasa, 4,451,424, Cl. 264-216.000.

Kyocera Corporation: *See—*
Kawamura, Takao; and Yoshida, Masazumi, 4,451,546, Cl. 430-69.000.

La Telemecanique Electrique: *See—*
Koehler, Gerard, 4,451,808, Cl. 335-229.000.

Labaig, Jean-Jacques: *See—*
Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,451,526, Cl. 428-216.000.

LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., to Burroughs Corporation. Optical storage system employing a multi-layer optical medium. 4,451,914, Cl. 369-109.000.

LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., to Burroughs Corporation. Optical storage system employing a multi-layer optical medium. 4,451,915, Cl. 369-109.000.

Lachenmeier, Kurt; and Simonson, Peter, to Kurt Lachenmeier ApS. Apparatus for the shrinking of wrapping foils. 4,451,233, Cl. 432-224.000.

Ladany, Ivan: *See—*
Marinelli, Donald P.; and Ladany, Ivan, 4,451,727, Cl. 219-464.000.

Lagendijk, Johannes. Suspended roof. 4,450,656, Cl. 52-63.000.

Lagos, Costas C., to GTE Products Corporation. Fluorescent lamp having improved maintenance. 4,451,757, Cl. 313-489.000.

L'Air Liquide - Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Malafosse, Jean, 4,451,384, Cl. 252-102.000.

Lairloup, Jean-Claude, to Nobel-Bozel. Preparation of lightweight, insulating and semirigid or rigid elements. 4,451,310, Cl. 156-78.000.

Lamarche, Paul E., to Borg-Warner Corporation. Series vibration damper with non-symmetrical curve. 4,451,244, Cl. 464-68.000.

Lamb-Weston, Inc.: *See—*
Santillie, Paul W.; and Ramras, Daniel M., 4,451,444, Cl. 423-480.000.

Lamphier, Larry N.; and Meyers, Walter A., to Bethlehem Steel Corp. Open top drain. 4,451,172, Cl. 405-49.000.

Landis, William R.; and Patton, Paul B., to Honeywell Inc. Flame safeguard sequencer having interlock checking means. 4,451,225, Cl. 431-14.000.

Landis, William R.; and Patton, Paul B., to Honeywell Inc. Flame safeguard sequencer having safe start check. 4,451,226, Cl. 431-15.000.

Landis, William R.; and Patton, Paul B., to Honeywell Inc. Flame safeguard sequencer having switch test functions. 4,451,227, Cl. 431-18.000.

Lange, Bradley N., to Advanced Semiconductor Materials Die Bonding, Inc. Object detection apparatus and method. 4,451,197, Cl. 414-737.000.

Langley, Kenneth R., to Rolls Royce Limited. Turbomachine rotor blade fixings. 4,451,203, Cl. 416-215.000.

Langsam, Michael: *See—*
Cheng, John T. C.; and Langsam, Michael, 4,451,625, Cl. 526-62.000.

Langston, Benny: *See—*
Bauer, Carl F.; Hussey, James H.; and Langston, Benny, 4,451,287, Cl. 75-24.000.

Lanza, Benjamin A.: *See—*
Harasym, Michael F.; and Lanza, Benjamin A., 4,450,986, Cl. 222-591.000.

Lappo, Viktor G.: *See—*
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Lardellier, Alain M. J.: *See—*
Forestier, Alexandre; and Lardellier, Alain M. J., 4,451,110, Cl. 308-184.00R.

Large, Michael S., to Imperial Chemical Industries PLC. Alcohol derivatives. 4,451,463, Cl. 424-249.000.

Larkin, Joseph F.: *See—*
Leiby, John J.; Hodge, Malcolm H.; and Larkin, Joseph F., 4,450,995, Cl. 225-2.000.

Larsen, Kurt K., to Blue Giant Equipment of Canada Ltd. Lip construction for dock leveller. 4,450,598, Cl. 14-71.100.

Larson, Duane B.; and Westermeier, Richard J., to Bethlehem Steel Corp. Cobble suppressing means. 4,450,702, Cl. 72-250.000.

Lasurdo, Mary H., to Trovato, Susan Ann, a part interest. Picture frame. 4,450,636, Cl. 40-152.000.

Laughon, Thomas C.: *See—*
Warner, Richard C.; and Laughon, Thomas C., 4,451,865, Cl. 361-23.000.

Lauterbach, John H.: *See—*
Dola, Frank P.; and Lauterbach, John H., 4,451,107, Cl. 339-143.00R.

Lauterburg, Rainer; and Geiger, Hans, to Societe Suisee pour l'Industrie Horlogere Management Services, S.A. Pushbutton switch for a timepiece. 4,451,719, Cl. 200-159.00R.

LaVigne, Gordon. Apparatus for dry placer mining and method of operating same. 4,451,357, Cl. 209-131.000.

Lawson, Louis L. Foot-rest device for motorcycles. 4,451,057, Cl. 280-291.000.

Lay, George E.; and Haigh, Daniel H., to Dow Chemical Company, The. Method for treating contact dermatitis. 4,451,453, Cl. 424-81.000.

Leal, Vitervo. Fishing lure. 4,450,644, Cl. 43-42.200.

Lear Siegler, Inc.: *See*—
Gagelin, Martin J., 4,451,052, Cl. 280-43.230.

Learn, Thomas C.: *See*—
Khouropour, Mostafa M.; and Learn, Thomas C., 4,450,932, Cl. 181-211.000.

Le Cann, Robert; and Fache, Jean-Paul, to Frigofrance S.A. Helically guided endless belt conveyor. 4,450,953, Cl. 198-778.000.

Lee, Biing-Lin, to B. F. Goodrich Company, The. Heterogeneous rubber compositions made from chemically similar blends. 4,451,595, Cl. 523-351.000.

Lee, Neville K. S.: *See*—
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,914, Cl. 369-109.000.
LaBudde, Edward V.; Capote, Miguel A.; Chao, Shiuh; and Lee, Neville K. S., 4,451,915, Cl. 369-109.000.

Lee, Robert E. Propulsion means actuated by weight. 4,451,055, Cl. 280-221.000.

Leesona Corporation: *See*—
Brouwer, Charles W.; and Cowan, Larry C., 4,450,874, Cl. 139-429.000.

Lefaucheux, Jean-Louis J. R.; Martin, Claude; and Mokrani, Edmond E. A., to Societe Anonyme de Telecommunications. Process and device for measuring the pressure of tires, particularly for aircraft. 4,450,716, Cl. 73-146.500.

Lefevre, Marcel R., to Research-Cottrell. Support means for transverse fill for cooling towers. 4,451,411, Cl. 261-111.000.

Legeai, Gilbert E., to Hauserman, Inc. Unitized partition wall system. 4,450,658, Cl. 52-126.300.

Leiby, John J.; Hodge, Malcolm H.; and Larkin, Joseph F., to TRW Inc. Scribing machine for optical fibers and method. 4,450,995, Cl. 225-2.000.

Leiponen, Matti O., to Outokumpu Oy. Method and apparatus for converting matte, particularly high-grade matte. 4,451,291, Cl. 75-73.000.

LeLoux, Arnoldus W. J., to Wavin B.V. Method and device for making seals in tubular web provided with side gussets. 4,451,308, Cl. 156-64.000.

Lemanski, Michael F.; and Kliewer, Wayne R., to Standard Oil Company, The. Mixed metal oxide catalyst for producing low molecular weight hydrocarbons from carbon monoxide and hydrogen. 4,451,579, Cl. 502-306.000.

Lemay, Richard A.: *See*—
Stanley, Philip E.; Woods, William E.; Lemay, Richard A.; and Cushing, David E., 4,451,883, Cl. 364-200.000.

Lengyel, Denes: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.00R.

Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Air transport system. 4,451,182, Cl. 406-86.000.

Lenk, Pedro A.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.

Leonard, Eric M.; Geyer, Frederick F.; and Myers, George M., to Eastman Kodak Company. Optical disc write/read apparatus. 4,451,836, Cl. 346-137.000.

Leonard, Mark, to Hewlett-Packard Company. Apparatus and method for modulating light to generate an index pulse. 4,451,731, Cl. 250-237.0SE.

Leonard Thomas K.: *See*—
Bellamy, Robert L., Jr.; Bersot, James D.; Leonard Thomas K.; and Muse, Richard R., 4,451,190, Cl. 411-337.000.

Lerch, John A. Dry acetylene generator. 4,451,268, Cl. 48-3.00A.

Lermann, Peter: *See*—
Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, 4,451,011, Cl. 242-71.000.

Lerschen, James R.: *See*—
DeKezel, James A.; and Lerschen, James R., 4,450,642, Cl. 43-3.000.

Lesher, George Y.: *See*—
Singh, Baldev; and Lesher, George Y., 4,451,469, Cl. 424-263.000.

Lesieur, Roger R.: *See*—
Setzer, Herbert J.; Bett, John A. S.; and Lesieur, Roger R., 4,451,578, Cl. 502-303.000.

Levaggi, Vittorio: *See*—
Bocci, Giorgio; Dardano, Alberto; Levaggi, Vittorio; and Milani, Ambrogio, 4,451,230, Cl. 431-284.000.

Lever Brothers Company: *See*—
Tai, Loui H. T., 4,451,387, Cl. 252-174.150.

Levine, Stanley R.: *See*—
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,451,496, Cl. 427-34.000.

Levos, Christian; Perie, Daniel; and Gex, Jean-Francois, to Commissariat a l'Energie Atomique. Liquid sampler wherein solution to be sampled is used as retrievable sampler wash. 4,450,730, Cl. 73-864.610.

Levy, Richard. Method for cleaning the surface of swimming pools. 4,451,379, Cl. 210-728.000.

Lew, Hyok S. Device for imposing the linear and angular movement to the valve stem. 4,450,732, Cl. 74-107.000.

Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., to Allied Corporation. Method for texturizing continuous filaments. 4,450,607, Cl. 28-257.000.

Li, Hsin L., to Allied Corporation. Winder string-up aspirator. 4,450,997, Cl. 226-97.000.

Li, Hsin L.: *See*—
Belden, Reed H.; Li, Hsin L.; and Sawheny, Dulari L., 4,450,891, Cl. 164-463.000.

Libby, Stephen C., to Aluminum Company of America. Causticization method. 4,451,443, Cl. 423-432.000.

Libertini, Zoltan L.; and Hartel, Edward O., to Avco Corporation. Air and oil cooled bearing package. 4,451,200, Cl. 415-110.000.

Lichtin, Norman N.; and Vijayakumar, Kalambella M., to Atlantic Richfield Company. Light driven photocatalytic process. 4,451,342, Cl. 204-157.10R.

Lifshitz, Nadia: *See*—
Fuls, Ellis N.; Lifshitz, Nadia; and Vaidya, Sheila, 4,450,620, Cl. 29-571.000.

Liland, Alfred L.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,450,607, Cl. 28-257.000.

Liljequist, Jon L. Mechanical arrangements for piston-crankshaft devices. 4,450,754, Cl. 92-138.000.

Lin, Jiang-Jen: *See*—
Knifton, John F.; Lin, Jiang-Jen; Grigsby, Robert A., Jr.; and Brader, Walter H., Jr., 4,451,679, Cl. 568-909.000.

Lindblad, Per-Olov: *See*—
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., 4,451,332, Cl. 162-30.100.

Linde, Klaus: *See*—
Flocke, Gunter; Jutte, Hans; Linde, Klaus; Klamke, Winfried; and Hampel, Werner, 4,451,176, Cl. 405-146.000.

Lindeboom, Herman: *See*—
Krasnoff, Eugene L.; and Lindeboom, Herman, 4,450,920, Cl. 173-80.000.

Lindenstruth, Werner: *See*—
Bye, Donald J.; Stanistreet, Harold P.; and Lindenstruth, Werner, 4,451,419, Cl. 264-164.000.

Lindstrom, Lars-Ake T.: *See*—
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., 4,451,332, Cl. 162-30.100.

Lineberry, Cletus E.: *See*—
Buckner, John G.; Lineberry, Cletus E.; and Harris, Jimmy W., 4,450,739, Cl. 83-23.000.

Lippl, Leo: *See*—
Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, 4,451,011, Cl. 242-71.000.

Lisle Corporation: *See*—
Miller, Merrill R., 4,451,810, Cl. 335-285.000.

Litton Systems, Inc.: *See*—
Hoffman, George J., 4,451,811, Cl. 335-302.000.

Liu, Chi-Sheng; and Hirayama, Chikara, to Westinghouse Electric Corp. Mercury halide lasers utilizing electrodes coated with a getter. 4,451,924, Cl. 372-59.000.

Liu, James C. C.: *See*—
Sperrazza, Joseph; Liu, James C. C.; and Baker, Wilfred E., 4,451,178, Cl. 405-258.000.

Liu, Tony Y.: *See*—
Kozak, Henry A.; and Liu, Tony Y., 4,451,591, Cl. 523-177.000.

Livne, Avinoam: *See*—
Trop, Moshe; and Livne, Avinoam, 4,451,491, Cl. 426-555.000.

Llumar Star Kites: *See*—
Mellinger, Ellis, 4,450,784, Cl. 114-39.000.

Locher, Johannes: *See*—
Fischer, Werner; and Locher, Johannes, 4,451,778, Cl. 323-282.000.

Lock, Michele R.: *See*—
Frisch, Kurt C., Jr.; Lock, Michele R.; and Stuk, Gregory J., 4,451,627, Cl. 526-192.000.

Lockheed Corporation: *See*—
Stuckey, Clarence W., Jr.; and Meyers, Robert A., deceased, 4,451,829, Cl. 343-705.000.

Loctite Corporation: *See*—
Nativi, Larry A.; and Kadziela, Kris, 4,451,523, Cl. 428-209.000.

Loctite (Ireland) Limited: *See*—
Charnock, Ronald S., 4,451,615, Cl. 525-98.000.

Loeb, Marvin P.: *See*—
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,450,836, Cl. 128-127.000.

Lohr, Delmar F.; and Schulz, Donald N., to Firestone Tire & Rubber Company, The. Molecular weight distribution and microstructure modifiers for elastomers. 4,451,576, Cl. 502-155.000.

Loiseaux, Brigitte; Huignard, Jean P.; Dubois, Jean C.; and Eranian, Armand, to Thomson-CSF. Process for producing diffracting phase structures. 4,451,412, Cl. 264-1.300.

Lok, Roger; Freeman, John P.; and Baum, William N., to Eastman Kodak Company. Photographic speed increasing and latent image stabilizing compounds, silver halide emulsions, and photographic elements. 4,451,557, Cl. 430-505.000.

Long, James C.: *See*—
Buschor, Josef J.; Long, James C.; and Schmidt, Dieter K., 4,450,949, Cl. 198-422.000.

Long, Thomas F., Jr., to Dana Corporation. Helical spline clutch plate separator. 4,450,943, Cl. 192-70.200.

Lonseth, Palmer; Selkirk, Neil T.; and Moorby, Donald G., to Canadian General Electric Company Limited. Capacitive signal coupler. 4,451,870, Cl. 361-433.000.

Look, Reinhard: *See*—
Sattler, Gunther; Gunkel, Werner; Witzgall, Manfred; and Look, Reinhard, 4,451,365, Cl. 210-198.200.

Lorenz, Dieter, to Siemens Aktiengesellschaft. Elastic-spring drive for the movable contact of an electric grounding or disconnect switch. 4,451,716, Cl. 200-67.00A.

Lorenz, Howard I., to Pool Company. Method and arrangement of transporting aggregate, fragmented material and the like. 4,451,183, Cl. 406-94.000.

Lorenz, Max R.: *See*—
Homola, Andrew M.; Lorenz, Max R.; and Sussner, Heinrich, 4,451,495, Cl. 427-27.000.

Loucks, Judith: *See*—
Gerber, Arthur M.; and Loucks, Judith, 4,451,560, Cl. 430-567.000.

Lovasz nee Gaspar, Mariann: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Love, Mahlon L., to Deere & Company. Combine harvester with modified feeder house. 4,450,671, Cl. 56-14.600.

Love, Samuel D. Andiron mounting system. 4,450,827, Cl. 126-298.000.

Lucas, James G.; Young, Alan C.; and Hinds, Paul M., to Commonwealth of Australia, The. VHF Omni-range navigation system antenna. 4,451,830, Cl. 343-768.000.

Ludwig, Bernd, to Starkstrom Gummersbach GmbH. Device for mounting an electric device, in particular a cam switch on a mounting plate. 4,451,720, Cl. 200-296.000.

Lurssen, Klaus: *See*—
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.

Lustig, Thomas P., to Development Finance Corp. of New Zealand. Onion peeling means. 4,450,762, Cl. 99-584.000.

Luxemburg, S. Roy. Process for cleaning an oil-contaminated brine containing particulate drill cutting solids. 4,451,377, Cl. 210-708.000.

Lynch Communication Systems, Inc.: *See*—
DeCoursey, Calvin H., 4,451,917, Cl. 370-108.000.

Lynell Medical Technology Inc.: *See*—
Poler, Stanley, 4,450,593, Cl. 3-13.000.

Lyothier, Robert M.: *See*—
Philippe, Jean-Jacques; and Lyothier, Robert M., 4,451,206, Cl. 416-228.000.

M. A. Kempner, Inc.: *See*—
Kempner, Marvin A.; and Elder, Robert E., 4,451,700, Cl. 179-2.0AS.

M.A.N. Roland Druckmaschinen Aktiengesellschaft: *See*—
Wildmann, Wolfgang; and Melzer, Rudolf, 4,451,029, Cl. 271-236.000.

MacKenzie, Peter A.: *See*—
Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., 4,451,221, Cl. 425-8.000.

Madore, Michel: *See*—
Gerard, Philippe; Jouve, Hubert; and Madore, Michel, 4,451,500, Cl. 427-38.000.

Maeda, Katsura: *See*—
Akagi, Takao; Yamaguchi, Shinji; Maeda, Katsura; and Yamamoto, Kazuo, 4,451,534, Cl. 428-372.000.

Maeda, Kouzo, to Nissan Motor Co., Ltd. Vehicle seat assembly having a door stopper. 4,451,078, Cl. 296-188.000.

Maekawa, Tsukasa; and Gondo, Takeshi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran. 4,451,662, Cl. 549-462.000.

Maeno, Yoshio: *See*—
Furuta, Mamoru; Maeno, Yoshio; and Kobayashi, Kazuo, 4,451,418, Cl. 264-63.000.

Magee, Robert J., to Charles Stark Draper Laboratory, Inc., The. Optical angular interval marker. 4,451,148, Cl. 356-138.000.

Magic Chef, Inc.: *See*—
Sharpe, Verlos G.; and Beers, David G., 4,450,692, Cl. 62-233.000.

Magyar, John C., to Kerr-McGee Chemical Corporation. System for protecting glass structures in a combustion zone. 4,451,511, Cl. 428-35.000.

Maida, Osamu, to Nippon Kogaku K.K. Film take-up apparatus in camera usable together with a film magazine device. 4,451,150, Cl. 354-173.110.

Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, to Ciba-Geigy Corporation. Derivatives of 2-nitro-4- or -5-pyridyloxyphenylphosphonic acid, the preparation thereof, the use thereof as herbicides and/or plant growth regulators. 4,451,284, Cl. 71-94.000.

Maillefer S.A.: *See*—
Veyrassat, Louis; and Meisser, Marc, 4,451,008, Cl. 242-25.00A.

Maiocco, Guiseppe A., to Champion Spark Plug Italiana, S.p.A. Wiper bridge and connector. 4,450,602, Cl. 15-250.320.

Makarova, Inna I.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

Makedonski, Boris G.; and Atanassov, Haralampi A., to Centralen Mashinostroitelen Institute. Polishing composition for centrifugal magnetic-abrasive machines. 4,451,269, Cl. 51-303.000.

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Maltese, Peter C. Adjustable weight fishing device. 4,450,646, Cl. 43-43.140.

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Forte, Don A.; and Aldava, Michael B., 4,451,762, Cl. 315-87.000.
Odle, Herbert A.; Green, John D.; and Shadwick, Jan, 4,451,875, Cl. 362-297.000.
Sadler, Thomas H.; and Dalton, John J., 4,450,873, Cl. 138-174.000.

Manzi, Joseph, to Gossling Development Corporation. Pull and release exercise device. 4,451,035, Cl. 272-137.000.

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Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,451,475, Cl. 424-270.000.

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Glass, William T.; and Glass, Michael T., 4,450,975, Cl. 220-18.000.

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Knabel, Walter; Wagner, Ludwig; and Jungkind, Roland, 4,451,059, Cl. 280-632.000.

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Wardley, George, 4,450,731, Cl. 74-25.000.

Marriott, Joe E.: *See*—
Palermo, David W.; Ricci, David W.; Marriott, Joe E.; and Heger, Thomas J., 4,451,898, Cl. 364-900.000.

Marrs, Ralph E. Acoustic energy systems. 4,450,929, Cl. 181-146.000.

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Marsh, William E., Jr., deceased; and Marsh, Elizabeth A., executrix, 4,450,969, Cl. 211-189.000.

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Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,451,279, Cl. 71-93.000.

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Griffin, Robert M.; and Martin, Roy C., 4,451,760, Cl. 313-557.000.

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Claude, Bruno; Labaig, Jean-Jacques; and Martinez, Christian, 4,451,526, Cl. 428-216.000.

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Garcia, Rodrigo A.; and Martinovich, Robert J., 4,451,607, Cl. 524-494.000.

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De Clippeleir, Georges E. M. J.; Cahen, Raymond M.; and Martins Mendes Cerejo, Francisco A., 4,451,686, Cl. 585-444.000.

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Akita, Yoshio; Teshima, Takanori; Maruyama, Toshinori; and Torii, Koshi, 4,451,774, Cl. 320-64.000.

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Dokhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.

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Bailey, Alfred J., 4,450,779, Cl. 111-52.000.
Gardner, Peter C., 4,450,925, Cl. 180-89.100.
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Honma, Takao; Matsukura, Nobuaki; Murakami, Keisuke; and Matsuda, Susumu, 4,451,167, Cl. 400-621.000.

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Wada, Chuzoh; Matsuda, Yoshikazu; and Asano, Yoshio, 4,451,228, Cl. 431-76.000.

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Ohgami, Masaaki; and Matsui, Fujio, 4,451,793, Cl. 328-69.000.

Matsui, Hideo: *See*—
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Matsui, Kazuma: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,451,213, Cl. 417-366.000.

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Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, 4,451,752, Cl. 310-186.000.

Matsui, Takeshi: *See*—
Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, 4,451,888, Cl. 364-426.000.

Matsukura, Nobuaki: *See*—
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Matsumoto, Akio: *See*—
Iwaki, Yoshiyuki; Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,451,776, Cl. 322-22.000.

Matsumoto, Hiroshi: *See*—
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Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,451,512, Cl. 428-36.000.

Matsuoka, Yoshio: *See*—
Yamashita, Katsuji; Umetsu, Hiroshi; Sato, Hirotaka; Matsuoka, Yoshio; and Kida, Kei, 4,451,433, Cl. 422-63.000.

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Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,451,542, Cl. 429-174.000.

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Fujita, Osamu, 4,451,799, Cl. 330-255.000.
Honjo, Masahiro; and Tomita, Masao, 4,451,860, Cl. 360-77.000.
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Naito, Takao; Matsuda, Yutaka; and Nishimori, Yuzo, 4,450,948, Cl. 198-389.000.
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Wada, Ryoichi; Tsuchiya, Mitsuharu; Senoo, Takanori; and Odagi, Kanji, 4,451,919, Cl. 371-38.000.
Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, 4,451,758, Cl. 313-495.000.

Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mituji, 4,451,688, Cl. 585-524.000.

Matsuura, Masataka: *See*—
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, 4,451,554, Cl. 430-313.000.

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Klose, George J.; Rosenthal, Janice E.; Schneider, Thomas G.; and Schroeder, Robert F., 4,451,911, Cl. 369-31.000.

Matthews, Demetreos N.: *See*—
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., 4,451,575, Cl. 502-122.000.

Matthews, John B.; and Keller, Roger H., to Russell Matthews Industries Limited. Packaging or containing of bituminous products. 4,450,962, Cl. 206-447.000.

Matthey Rustenburg Refiners (Proprietary) Limited: *See*—
Hill, John; and Day, Joseph G., 4,451,290, Cl. 75-63.000.

Matyczyk, George: *See*—
Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,450,961, Cl. 206-349.000.

Maurel, Pierre; Bosca, Bernard; and Nicolas, Francois, to Pechiney. Process for the purification of solutions containing a sodium or potassium carbonate, sulphate, and possibly hydroxide, and at least one of the metals vanadium, uranium and molybdenum. 4,451,439, Cl. 423-55.000.

Mauro, Dominic R.: *See*—
Sinclair, Bernard J.; and Mauro, Dominic R., 4,451,036, Cl. 273-26.00R.

Max, John K. Flowmeter connecting rod assembly. 4,450,720, Cl. 73-247.000.

Mayer, Fritz; and Holtermann, Svein, to Ciba-Geigy Corporation. After-treatment of finished, cellulose-containing fibrous materials with liquid ammonia. 4,451,262, Cl. 8-125.000.

Mayer, Steven T.; and Emmons, Lawrence D., to Atari, Inc. Method and apparatus for text editing display. 4,451,900, Cl. 364-900.000.

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McCall, Francis J. Electrical pulse acupressure apparatus and method of making same. 4,450,846, Cl. 128-789.000.

McCloskey, John A., to Incom International Inc. Rod ends and blanks and method and apparatus for making same. 4,450,703, Cl. 72-342.000.

McComb, Ronald J.: *See*—
Fritz, William E.; and McComb, Ronald J., 4,450,773, Cl. 105-282.00A.

McCormick, Vernon R.: *See*—
Buresh, Lloyd V.; Hammond, Garth D.; Koval, Emil J.; and McCormick, Vernon R., 4,451,103, Cl. 339-93.00R.

McGlashan, Kenneth W.; and Archer, John R., to RCA Corporation. Television raster pincushion distortion correction device. 4,451,807, Cl. 335-211.000.

McIntosh, John N.: *See*—
Barclay, John D.; and Harmon, Rawson B., Jr., 4,451,266, Cl. 44-53.000.

McKay, Richard H.; and Ryan, Geoffrey R., to Frank Thornber Co. Self-contained portable voting booth apparatus. 4,451,728, Cl. 235-50.00R.

McKelvey, Harold E., to Shatterproof Glass Corporation. Flexible vacuum bag. 4,451,321, Cl. 156-382.000.

McKenna, William A. Crutch for use on an icy surface. 4,450,850, Cl. 135-78.000.

McMurtry, David R. Method of and apparatus for measuring distances in numerically controlled machine tools. 4,451,892, Cl. 364-474.000.

McNamee, Patrick M. Tile mounting process and product. 4,450,664, Cl. 52-385.000.

McNeill, William H.; and Chen, Yung J., to GTE Laboratories Incorporated. High frequency light modulation device. 4,451,123, Cl. 350-386.000.

Mead Corporation, The: *See*—
Wood, Prentice J., 4,450,956, Cl. 206-188.000.

Meador, Richard A., to NL Industries, Inc. Logging tool and method for measuring resistivity of different radial zones at a common depth of measurement. 4,451,789, Cl. 324-338.000.

Mechanical Technology Inc.: *See*—
Bergman, Ulf C., 4,450,859, Cl. 137-516.290.
Corey, John A., 4,450,685, Cl. 60-520.000.

Medcalf, Darrell G.: *See*—
Beale, Robert J.; Bradbury, Allen G. W.; Medcalf, Darrell G.; and Romig, William R., 4,451,489, Cl. 426-254.000.

Medishield Corporation Limited, The: *See*—
Gregory, Raymond S., 4,450,852, Cl. 137-114.000.

Medtronic, Inc.: *See*—
Nettekoven, William S., 4,450,710, Cl. 73-37.000.

Meeks, Lawrence A.: *See*—
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Meisel, Mark. Bicycle bag system. 4,450,988, Cl. 224-32.00A.

Meisner, Roland A., to BASF Farben +Fasern AG. Apparatus for coating objects electrostatically. 4,450,785, Cl. 118-626.000.

Meisser, Marc: *See*—
Veyrasat, Louis; and Meisser, Marc, 4,451,008, Cl. 242-25.00A.

Meixner, Jurgen: *See*—
Frank, Walter; Bendszus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, 4,451,509, Cl. 427-54.100.

Melcher, Franz-Josef: *See*—
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Behrend, Lothar; Knothe, Eric; Melcher, Franz-Josef; and Ober, Jurgen, 4,450,924, Cl. 177-212.000.
Melchiori, Remo, Jr. Tensioned structure with adjustably movable columns and beams. 4,450,662, Cl. 52-223.00R.
Mellinger, Ellis, to Llumar Star Kites. Hand-carryable flying sailboat. 4,450,784, Cl. 114-39.000.
Melone, Robert R., to Smith Investment Company. Quick connect fluid coupling. 4,451,069, Cl. 285-86.000.
Melzer, Rudolf: *See*—
Wildmann, Wolfgang; and Melzer, Rudolf, 4,451,029, Cl. 271-236.000.
Memorex Corporation: *See*—
Beckenhauer, Robert L., 4,451,819, Cl. 340-347.0DD.
Memorial Hospital for Cancer and Allied Diseases: *See*—
Miodownik, Saul, 4,450,838, Cl. 128-204.230.
Mercado Rehabilitering AB: *See*—
Seven, Regnell, 4,451,086, Cl. 297-312.000.
Mercer, Scott A.: *See*—
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Sattler, Gunther; Gunkel, Werner; Witzgall, Manfred; and Look, Reinhard, 4,451,365, Cl. 210-198.200.
Mericle, Robert W.; and Transue, James A., to Ethicon, Inc. Ligating clip with flanged base having a recessed engaging face. 4,450,840, Cl. 128-325.000.
Merkle, Hans: *See*—
Hansen, Hanspeter; Merkle, Hans; and Mueller, Albrecht, 4,451,378, Cl. 210-725.000.
Merriss, Charles E. Rear view mirror extension assembly. 4,451,021, Cl. 248-480.000.
Meshirer, Milton: *See*—
Kerr, Stuart R., III; and Meshirer, Milton, 4,451,529, Cl. 428-319.300.
Messerschmitt-Bolkow-Blohm G.m.b.H.: *See*—
Hahnel, Thomas, 4,450,679, Cl. 60-251.000.
Messrs. Muse Mannequin Co., Ltd.: *See*—
Kashiwabara, Mikio, 4,450,971, Cl. 211-201.000.
Metallbau Treiber KG: *See*—
Treiber, Josef; and Reichmann, Walter, 4,450,701, Cl. 72-181.000.
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Ernst, Helmut; Gehrhardt, Karl-Heinz; Uhl, Leopold; and Wolert, Hartmut, 4,451,232, Cl. 432-103.000.
Wullenweber, Heinz, 4,451,347, Cl. 204-258.000.
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Van Hecke, Michel C.; and Fontainas, Luc M., 4,451,289, Cl. 75-63.000.
Mettler Instrumente AG: *See*—
Zulliger, Hans-Rudolf, 4,451,817, Cl. 338-47.000.
Meunier, Georges; and Bergougnou, Maurice A., to Tunzini-Nessi Enterprises D'Equipements. Process and apparatus for heating or cooling light solid particles. 4,450,895, Cl. 165-1.000.
Meyer, Daniel: *See*—
Wiseheart, Ronald W.; and Meyer, Daniel, 4,451,106, Cl. 339-123.000.
Meyer-Kretschmer, Gustav; Jetter, Heinz; and Toennies, Peter, to URANIT Uran-Isotopentrennungs-GmbH. Method for separating different isotopes in compounds by means of laser radiation. 4,451,437, Cl. 423-3.000.
Meyer, Louis W., to Dow Chemical Company, The. Method for injection molding polyurethane using internal release agents. 4,451,425, Cl. 264-300.000.
Meyer, Marcus F. Reusable rod assembly for mounting boxed rolls of material. 4,451,010, Cl. 242-55.530.
Meyers, Carol Mae, executrix: *See*—
Stuckey, Clarence W., Jr.; and Meyers, Robert A., deceased, 4,451,829, Cl. 343-705.000.
Meyers, John J.; and Pulver, John C., to Eastman Kodak Company. Composite mirror and method of construction. 4,451,119, Cl. 350-310.000.
Meyers, Robert A., deceased: *See*—
Stuckey, Clarence W., Jr.; and Meyers, Robert A., deceased, 4,451,829, Cl. 343-705.000.
Meyers, Walter A.: *See*—
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Mezawa, Tsutomu: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; Enomoto, Seiji; and Mezawa, Tsutomu, 4,451,908, Cl. 365-222.000.
Michaelis, Paul R.: *See*—
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Microcomputer Systems, Inc.: *See*—
Gilovich, Paul A.; and Toreson, James S., 4,451,861, Cl. 360-84.000.
Microdot Inc.: *See*—
Repella, James A., 4,450,614, Cl. 29-417.000.
Repella, James A., 4,451,050, Cl. 277-134.000.
Mid Coast Electronics: *See*—
Zuniga, Michael A., 4,451,113, Cl. 339-12.00R.
Mikado, Tsuneo, to Nippon Television Industry Corporation. Still picture reproducing apparatus. 4,451,857, Cl. 358-312.000.
Mil Mutzarim Techniim B.M.: *See*—
Zakai, Avi, 4,451,023, Cl. 251-5.000.
Milani, Ambrogio: *See*—
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Milkovic, Miran, to General Electric Company. Electronic watt transducer circuit with constant DC current output proportional to watts. 4,451,784, Cl. 324-142.000.
Milkowski, Wolfgang: *See*—
Hackmeister, Bernd; Milkowski, Wolfgang; Kuhl, Ulrich; Buschmann, Gerd; and Budden, Renke, 4,451,468, Cl. 424-256.000.
Millay, Lawrence I.: *See*—
Reda, Kazimierz J.; Dzewaltowski, Victor F.; Millay, Lawrence I.; and Hobbs, Robert N., 4,450,651, Cl. 51-5.00D.
Miller, Donald E.; and Werstak, Charles E., to SCM Corporation. Salad dressings of the separating type. 4,451,493, Cl. 426-602.000.
Miller, Jeorge, to Hidrotronic de Colombia, S.A. Electrolytic water sterilization system. 4,451,341, Cl. 204-149.000.
Miller, Merrill R., to Lisle Corporation. Magnetic tool holder. 4,451,810, Cl. 335-285.000.
Mills, Kenneth R., to Phillips Petroleum Company. Stabilized polyolefin compositions. 4,451,604, Cl. 524-312.000.
Ministry of International Trade & Industry: *See*—
Terada, Shoji, 4,451,415, Cl. 264-43.000.
Minneapolis Medical Research Foundation, Inc.: *See*—
Engel, Rolf R., 4,450,845, Cl. 128-743.000.
Minnesota Mining and Manufacturing Company: *See*—
Heilmann, Steven M.; Rasmussen, Jerald K.; and Palensky, Frederick J., 4,451,619, Cl. 525-379.000.
Mitra, Sumita B., 4,451,260, Cl. 604-890.000.
Olyphant, Murray, Jr., 4,451,527, Cl. 428-220.000.
Rousseau, Alan D.; and Reilly, Laurence W., Jr., 4,451,613, Cl. 525-54.310.
Theodore, John J., 4,451,605, Cl. 524-423.000.
Wong, Roy; Pedginski, James J.; and Wong, Andrew H., 4,451,533, Cl. 428-337.000.
Minnich, George E.; and Applegate, Clark L., to Singer Company, The. Electronic compensator for an electrohydraulic servovalve. 4,451,769, Cl. 318-689.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kawamura, Takao; and Yoshida, Masazumi, 4,451,546, Cl. 430-69.000.
Minster Machine Company: *See*—
Olding, Michael J.; and Schoch, Daniel A., 4,450,946, Cl. 192-0.084.
Miodownik, Saul, to Memorial Hospital for Cancer and Allied Diseases. Jet ventilator control system. 4,450,838, Cl. 128-204.230.
Misawa Homes K.K.: *See*—
Hanaoka, Tadashi; Umezu, Hiroaki; and Shigaraki, Ginichi, 4,450,659, Cl. 52-167.000.
Misumi, Teruo: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,451,547, Cl. 430-128.000.
Mita Industrial Co., Ltd.: *See*—
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Mitchell, Bruce R.; and Vogel, Roger F., to Gulf Research & Development Company. Vanadium passivation in a hydrocarbon catalytic cracking process. 4,451,355, Cl. 208-113.000.
Mitchell, David S., to Chevron Research Company. Apparatus and method for feeding pulverized hydrocarbonaceous solids into a high pressure reactor. 4,451,184, Cl. 406-105.000.
Mitra, Sumita B., to Minnesota Mining and Manufacturing Company. Sustained release oral medicinal delivery device. 4,451,260, Cl. 604-890.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Iwaki, Yoshiyuki; Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,451,776, Cl. 322-22.000.
Ogawa, Koji; Taguchi, Hiroaki; Tsutsumi, Takao; Yasuda, Yoshinori; and Takase, Akio, 4,451,043, Cl. 273-186.00R.
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; Yamamoto, Kiyomi; Yoshiyasu, Hajimu; and Wada, Yuichi, 4,451,718, Cl. 200-147.00R.
Mitsui Engineering & Shipbuilding Co. Ltd.: *See*—
Yamato, Isao; and Yamada, Tominori, 4,451,212, Cl. 417-313.000.
Miura, Hiroshi: *See*—
Fudatsuji, Toshiharu; Imagi, Tsutomu; and Miura, Hiroshi, 4,451,165, Cl. 400-196.100.
Miura, Nobuhiro; and Takahashi, Kazushi, to Toyota Jidosha Kabushiki Kaisha. Intake air throttle device of a diesel engine. 4,450,806, Cl. 123-401.000.
Miura, Nobuhiro: *See*—
Kinoshita, Takahiko; Kakeno, Nobuhiko; and Miura, Nobuhiro, 4,450,807, Cl. 123-403.000.
Miura, Toshikatu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, to Nissan Motor Company, Limited. Reinforcing member. 4,451,518, Cl. 428-137.000.
Miyachi, Kazuaki: *See*—
Nemoto, Hiroshi; Miyachi, Kazuaki; and Komoda, Akira, 4,451,345, Cl. 204-206.000.
Miyagawa, Masafumi: *See*—
Hiraki, Shunichi; Kikuchi, Kiyoshi; Yawata, Shigeo; and Miyagawa, Masafumi, 4,451,303, Cl. 148-187.000.
Miyazaki, Tadashi; and Hasegawa, Takao, to Carl Freudenberg, Firma. Method for manufacturing a dampening roll cover. 4,451,311, Cl. 156-86.000.
Miyazaki, Tadashi, to Carl Freudenberg, Firma. Process for producing a non-woven fabric. 4,451,315, Cl. 156-220.000.

Miyazawa, Hideo; and Kitamura, Junzo, to Hitachi, Ltd. Method of conveying panel and shadow mask and pallet for holding panel and shadow mask and apparatus for removing shadow mask from panel. 4,451,242, Cl. 445-65.000.
Miyazawa, Tetsuo: *See*—
Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, 4,451,506, Cl. 427-239.000.
Miyoshi, Mituji: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mituji, 4,451,688, Cl. 585-524.000.
Mizuno Corporation: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,042, Cl. 273-171.000.
Mizunawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, 4,450,885, Cl. 164-47.000.
Moberg, Gregory D.; and Hudson, Lynn R., to Eastman Kodak Company. Passive clamp for on/off control of a capacitor charger. 4,451,772, Cl. 320-1.000.
Mobil Oil Corporation: *See*—
Chen, Catherine S. H., 4,451,623, Cl. 525-505.000.
Hunt, William C., III, 4,450,910, Cl. 166-261.000.
Kozak, Henry A.; and Liu, Tony Y., 4,451,591, Cl. 523-177.000.
Shu, Winston R.; and Hartman, Kathy J., 4,450,911, Cl. 166-263.000.
Wang, Jerry C.; and Stepanian, Michael R., 4,451,612, Cl. 525-53.000.
Moe, Per H. Arrangement in or relating to a power plant. 4,450,689, Cl. 60-641.700.
Moerman, Richard A.: *See*—
Dvorak, Bolek, 4,451,322, Cl. 156-461.000.
Moffitt, Merritt L., Jr. Half-reader sunglasses. 4,451,127, Cl. 351-47.000.
Mogami Denki Kabushiki Kaisha: *See*—
Kawahara, Fumio; Takahashi, Masanori; and Kumagai, Katsuyoshi, 4,451,609, Cl. 524-708.000.
Mohasco Corporation: *See*—
Kowalski, Jerome R., 4,451,081, Cl. 297-61.000.
Mokrani, Edmond E. A.: *See*—
Lefaucheux, Jean-Louis J. R.; Martin, Claude; and Mokrani, Edmond E. A., 4,450,716, Cl. 73-146.500.
Momose, Yoshiaki: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hidewo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,451,417, Cl. 264-53.000.
Monitek, Inc.: *See*—
Topol, George J.; and Trent, Chadwick L., 4,451,152, Cl. 356-440.000.
Moniteq Ltd.: *See*—
Gray, Lawrence H., 4,451,765, Cl. 315-248.000.
Monogram Industries, Inc.: *See*—
Pratt, John D., 4,451,189, Cl. 411-34.000.
Monsanto Company: *See*—
Alt, Gerhard H., 4,451,285, Cl. 71-105.000.
Baker, Joseph W.; Mansfield, Dennis L.; and Weinkauff, David J., 4,451,486, Cl. 424-317.000.
Walsh, Robert J., 4,450,652, Cl. 51-131.400.
Montag, Bernhard: *See*—
Opitz, Heinrich; Montag, Bernhard; Urban, Gerd; and Turk, Wilfried, 4,450,896, Cl. 165-1.000.
Montedison, S.p.A.: *See*—
Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 4,451,646, Cl. 528-401.000.
Montgomery, James W.: *See*—
Baugh, John L.; and Montgomery, James W., 4,450,857, Cl. 137-318.000.
Montgomery, John A.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,451,650, Cl. 544-105.000.
Montgomery, Preston D. Hide press and method for shipping hides. 4,450,764, Cl. 100-37.000.
Monticelli, Dennis M., to National Semiconductor Corporation. Wideband linear carrier current amplifier. 4,451,801, Cl. 330-278.000.
Mookherjee, Barja D.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Barja D.; and Heinsohn, Howard H., Jr., 4,451,392, Cl. 252-522.00R.
Moorby, Donald G.: *See*—
Lonseth, Palmer; Selkirk, Neil R.; and Moorby, Donald G., 4,451,870, Cl. 361-433.000.
Moore, James C., to Teledyne Industries, Inc. Diverter valve and actuator assembly. 4,450,867, Cl. 137-625.440.
Moore, Max J.: *See*—
D'Angelo, Severino; and Moore, Max J., 4,450,728, Cl. 73-862.280.
Moreau, Patrice: *See*—
Calas, Patrick; Moreau, Patrice; and Commeyras, Auguste, 4,451,682, Cl. 570-142.000.
Mori, Kazuyuki: *See*—
Suzuki, Kouichi; and Mori, Kazuyuki, 4,451,890, Cl. 364-426.000.
Mori, Noboru: *See*—
Yagishita, Asaburo; Mori, Noboru; Kusumi, Kinshiro; and Tsugi, Yoshio, 4,451,298, Cl. 134-10.000.
Mori, Susumu: *See*—
Sakabe, Yukio; Nishioka, Goro; Azuma, Yoshimasa; and Mori, Susumu, 4,451,869, Cl. 361-309.000.
Mori, Tatsuo: *See*—
Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, 4,451,506, Cl. 427-239.000.
Moriguchi, Fujio: *See*—
Nakajima, Hisao; and Moriguchi, Fujio, 4,451,834, Cl. 346-76.0PH.
Moriguchi, Harukiko; Kurata, Masami; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Image data transmission process. 4,451,853, Cl. 358-281.000.
Moriguchi, Soyao: *See*—
Ishikawa, Masayuki; Eguchi, Yukuo; Moriguchi, Soyao; and Ebisawa, Hisashi, 4,451,467, Cl. 424-251.000.
Morimoto, Hiroyuki, to Shindaiwa Kogyo Co., Ltd. Device for determining a correct sawing position for a portable rotary sawing machine. 4,450,627, Cl. 30-391.000.
Morimoto, Kiyoshi; Takagi, Toshinori; and Watanabe, Hiroshi, to Futaba Denshi Kogyo Kabushiki Kaisha. Method for producing a beryllium oxide film 4,451,499, Cl. 427-38.000.
Morita, Deen I.; and Morita, Mark K. Water saving system. 4,450,829, Cl. 126-362.000.
Morita, Kiyoshi, to Yamashina Seiko-Sho, Ltd. Method of ensuring the tightness of a bolt and a nut. 4,450,616, Cl. 29-446.000.
Morita, Mark K.: *See*—
Morita, Deen I.; and Morita, Mark K., 4,450,829, Cl. 126-362.000.
Morita, Tatsuo: *See*—
Sawamoto, Kunifumi; Morita, Tatsuo; Ikeura, Kenji; and Yamaguchi, Hiroshi, 4,450,814, Cl. 123-478.000.
Moriuchi, Takahiko: *See*—
Kawazoe, Shiyouzou; Ueda, Zenichi; Sugimoto, Toshihiko; and Moriuchi, Takahiko, 4,451,525, Cl. 428-213.000.
Moriyama, Eiichi; and Kobayashi, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control device. 4,450,808, Cl. 123-417.000.
Morman, Michael T.; and Wisneski, Tony J., to Kimberly-Clark Corporation. Method of improving processability of polymers and resulting polymer compositions. 4,451,589, Cl. 523-124.000.
Morris, Corydon E.; and Jaliwala, Salim A., to Cummins Engine Company, Inc. Electronically controlled fuel pump. 4,450,783, Cl. 123-458.000.
Morris, Hugh C., to Caterpillar Tractor Co. Control system for converter lock-up and simultaneous pressure reduction. 4,450,941, Cl. 192-3.310.
Moser, Franz, to Werkzeugmaschinenfabrik Oerlikon Buhrle AG. Dummy ammunition. 4,450,769, Cl. 102-444.000.
Moser, Franz; and Visek, Tomas, to Steyr-Daimler Puch Aktiengesellschaft. Crank drive for diesel engine. 4,450,797, Cl. 123-78.00F.
Mossberg Industries, Inc.: *See*—
Kitt, Robert A.; and Wirts, Harold L., 4,451,014, Cl. 242-128.000.
Mostek Corporation: *See*—
Aswell, Cecil J., 4,451,742, Cl. 307-66.000.
Gerson, Isadore S.; and Briggs, Willard S., 4,451,885, Cl. 364-200.000.
Motoda, Nobuo: *See*—
Ito, Seitoku; Takeda, Kenji; Inagaki, Mitsuo; and Motoda, Nobuo, 4,451,220, Cl. 418-255.000.
Motokawa, Isamu: *See*—
Yoshikumi, Chikao; Sakurai, Katsuo; Omura, Yoshio; Nohara, Mayumi; Ando, Takao; and Motokawa, Isamu, 4,451,457, Cl. 424-180.000.
Motomak Motorenbau, Maschinen- Und Werkzeugfabrik, Konstruktionen GmbH: *See*—
Schaeffler, Georg; Spiess, Karl; Heyne, Jurgen E.; and Krost, Manfred, 4,450,704, Cl. 72-356.000.
Motorola Inc.: *See*—
Chapman, Ronald H.; and Peterson, Andrew F., 4,451,930, Cl. 455-260.000.
Donoghue, William J.; and Tesch, Rodney C., 4,451,907, Cl. 365-203.000.
Gay, Michael J., 4,451,792, Cl. 329-145.000.
Thayer, David J.; Krause, James J.; and Welk, John R., 4,451,824, Cl. 340-720.000.
Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, 4,450,793, Cl. 123-52.0MB.
Mount, James, to RCA Corporation. Electrical heating unit for sealing vacuum electron tubes. 4,451,725, Cl. 219-390.000.
Mouri, Yasunori, to Hitachi, Ltd. Internal combustion engine control apparatus. 4,450,815, Cl. 123-479.000.
Mouterde, Anne: *See*—
Decuq, Guy; and Mouterde, Anne, 4,451,006, Cl. 242-18.0DD.
Mower, Morris F.; and Johnson, Eugene R., to Bliss & Laughlin Industries, Inc. Corner finishing tool. 4,451,223, Cl. 425-458.000.
Moyer, Norman E., to Hughes Aircraft Company. Electrically erasable programmable read-only memory cell having a single transistor. 4,451,905, Cl. 365-185.000.
Mozer, Ferenc: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.00R.
Mracek, Miroslav: *See*—
Vertesy, Laszlo; Mracek, Miroslav; Braunitzer, Gerhard; and Aschauer, Heinz, 4,451,455, Cl. 424-177.000.
Mueller, Albrecht: *See*—
Hansen, Hanspeter; Merkle, Hans; and Mueller, Albrecht, 4,451,378, Cl. 210-725.000.

Mueller, Dieter J., to Chemische Werke Huels AG. Organic phosphating solution for the phosphating of metallic surfaces. 4,451,301, Cl. 148-6.15R.
Mueller, Hans-Rudolf: *See*—
Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, 4,451,478, Cl. 424-273.00R.
Muellner, James M., to Smarte Carte, Inc. Nestable cart anti-reversing apparatus. 4,450,968, Cl. 211-17.000.
Mugita, Mikio: *See*—
Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.
Mulertt, Charles: *See*—
Cinquin, Jean-Pierre; Danthony, Jacques; and Mulertt, Charles, 4,451,866, Cl. 361-56.000.
Muller, Jacques, to ETA S.A. Fabriques d'Ebauches. Movement for an electronic watch with analogue display. 4,451,161, Cl. 368-220.000.
Mumford, Eustace H., to Owens-Illinois, Inc. Multiple gob shearing mechanism operating in a straight line. 4,450,741, Cl. 83-623.000.
Munkel, Albert: *See*—
Dietz, Erwin; and Munkel, Albert, 4,451,656, Cl. 548-352.000.
Munroe, Warren T. Lightweight drawer support assembly having combination locking mechanism and common vertical drawer support. 4,451,111, Cl. 312-221.000.
Murai, Masataka; and Ishii, Kiyoshi, to Daicel Chemical Industries Ltd. Membrane separation element. 4,451,370, Cl. 210-321.100.
Murakami, Keisuke: *See*—
Honma, Takao; Matsukura, Nobuaki; Murakami, Keisuke; and Matsuda, Susumu, 4,451,167, Cl. 400-621.000.
Murao, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device with mode flags for dedicating memory segments as either scratchpad or timing control registers. 4,451,897, Cl. 364-900.000.
Murata Manufacturing Co., Ltd.: *See*—
Sakabe, Yukio; Nishioka, Goro; Azuma, Yoshimasa; and Mori, Susumu, 4,451,869, Cl. 361-309.000.
Murayama, Fumio, to Pioneer Electronic Corporation. Multi-speaker system for use in automobiles. 4,451,928, Cl. 381-86.000.
Murray, Lawrence K., to Phillips Petroleum Company. Drying of particulate material. 4,451,231, Cl. 432-13.000.
Muse, Richard R.: *See*—
Bellamy, Robert L., Jr.; Berset, James D.; Leonard Thomas K.; and Muse, Richard R., 4,451,190, Cl. 411-337.000.
Muszbek, Laszlo: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.
Mutsuro, Hideaki: *See*—
Yamashita, Hiromichi; Watari, Yoshiharu; Mutsuro, Hideaki; and Takagi, Kenji, 4,451,175, Cl. 405-50.000.
Myers, George M.: *See*—
Leonard, Eric M.; Geyer, Frederick F.; and Myers, George M., 4,451,836, Cl. 346-137.000.
Myers, Harry S., Jr.: *See*—
Young, Virgel J.; and Myers, Harry S., Jr., 4,451,847, Cl. 358-99.000.
Nadin, Robert P.: *See*—
Nicholakopoulos, Antonios; Gill, Grace M.; and Nadin, Robert P., 4,451,593, Cl. 523-322.000.
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 3,7-Diazabicyclo [3.3.1] nonanes having anti-arrhythmic activity. 4,451,473, Cl. 424-256.000.
Nagai, Hirosi: *See*—
Okuda, Kensuke; Nagai, Hirosi; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, 4,451,235, Cl. 433-201.000.
Nagano, Hirosaku: *See*—
Yonezawa, Kazuya; Kira, Kazuaki; Wakabayashi, Hiroshi; and Nagano, Hirosaku, 4,451,621, Cl. 525-426.000.
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Method of making a magnetic recording medium. 4,451,501, Cl. 427-40.000.
Nagao, Yoshiaki: *See*—
Fukuoka, Takashi; Nagao, Yoshiaki; and Tanaka, Hiroyuki, 4,450,933, Cl. 181-229.000.
Nagase, Hiroshi; Ninomiya, Hisakazu; and Ibori, Satoshi, to Hitachi, Ltd. Apparatus for controlling AC motor. 4,451,771, Cl. 318-800.000.
Nagashima, Masao: *See*—
Ito, Hiroshi; Yoshio, Toshihiko; and Nagashima, Masao, 4,450,611, Cl. 29-156.8FC.
Nagy, Bela A. Transparent sphere with moveable dividers and pieces. 4,451,038, Cl. 273-110.000.
Nahara, Akira: *See*—
Nagao, Makoto; Nahara, Akira; and Akashi, Goro, 4,451,501, Cl. 427-40.000.
Naher, Gotthilf: *See*—
Vetter, Hellmuth; Scheibe, Peter; Thum, Waldemar; and Naher, Gotthilf, 4,451,487, Cl. 435-183.000.
Naik, Subhash K., to Avco Corporation. Molybdenum-containing high temperature coatings for nickel- and cobalt-based superalloys. 4,451,431, Cl. 420-588.000.
Naito, Hiroyuki: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, 4,450,885, Cl. 164-47.000.
Naito, Takao; Matsuda, Yutaka; and Nishimori, Yuzo, to Matsushita Electric Industrial Company, Limited. Apparatus for supplying headed parts. 4,450,948, Cl. 198-389.000.
Nakada, Akira; and Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with plural tone production channels. 4,450,745, Cl. 84-1.190.
Nakada, Kazuhiko: *See*—
Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, 4,451,629, Cl. 526-238.230.
Nakagawa, Katsumi: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,451,547, Cl. 430-128.000.
Nakajima, Hisao; and Moriguchi, Fujio, to Fuji Xerox Co., Ltd. Transfer type heat sensitive recording device. 4,451,834, Cl. 346-76.0PH.
Nakajima, Kichio: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,451,893, Cl. 364-494.000.
Nakajima, Tatsutoshi: *See*—
Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, 4,451,629, Cl. 526-238.230.
Nakamiya, Teruaki: *See*—
Yasuda, Naohiko; Okutsu, Masaru; Iwagami, Hisao; Nakamiya, Teruaki; and Takase, Ichiro, 4,451,399, Cl. 260-239.100.
Nakamura Kinzoku Kogyosho, Inc.: *See*—
Enomoto, Michitoshi; and Shimizu, Yasuo, 4,450,886, Cl. 164-75.000.
Nakamura, Michio: *See*—
Komatsu, Shigeru; and Nakamura, Michio, 4,451,844, Cl. 357-59.000.
Nakamura, Shigeo: *See*—
Imazeki, Ryoji; Hattori, Masayuki; and Nakamura, Shigeo, 4,451,902, Cl. 365-1.000.
Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mituji, 4,451,688, Cl. 585-524.000.
Nakamura, Toshiaki: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,451,213, Cl. 417-366.000.
Nakano, Takao: *See*—
Sato, Hiroki; Nakano, Takao; Hatanaka, Masato; Ohhoshi, Toshio; and Tanaka, Sakae, 4,451,756, Cl. 313-422.000.
Nakano, Yutaka: *See*—
Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.
Nalco Chemical Company: *See*—
Payne, Charles C., 4,451,388, Cl. 252-313.00S.
Sharp, John D., 4,451,376, Cl. 210-701.000.
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, to Suzuki Kogyo Kabushiki Kaisha. Internal combustion engine. 4,450,803, Cl. 123-308.000.
Nandoh, Kenji: *See*—
Hattori, Motonobu; Tamuro, Yasuharu; Ishibashi, Akira; and Nandoh, Kenji, 4,451,112, Cl. 318-778.000.
Nanya, Takanori: *See*—
Hashimoto, Eigo; and Nanya, Takanori, 4,451,498, Cl. 427-38.000.
Napadov, Mikhail A.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.
Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,450,680, Cl. 60-274.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,450,812, Cl. 123-438.000.
Nasman, Lars E.: *See*—
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., 4,451,332, Cl. 162-30.100.
Nathan, Norman. Mobile air conditioning unit. 4,450,900, Cl. 165-42.000.
National Distillers and Chemical Corporation: *See*—
Barlow, Anthony; and Meeks, Lawrence A., 4,451,536, Cl. 428-383.000.
National Research Development Corporation: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,451,788, Cl. 324-309.000.
Smith, Kenneth C. A., 4,451,738, Cl. 250-492.200.
National Semiconductor Corporation: *See*—
Monticelli, Dennis M., 4,451,801, Cl. 330-278.000.
Nelson, Carl T., 4,451,839, Cl. 357-13.000.
National Slag Limited: *See*—
Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., 4,451,221, Cl. 425-8.000.
Nativi, Larry A.; and Kadziela, Kris, to Loctite Corporation. Conformal coating systems. 4,451,523, Cl. 428-209.000.
Natsuume, Tadao: *See*—
Yamato, Motoyuki; and Natsuume, Tadao, 4,451,637, Cl. 528-115.000.

Nederlandse Kunststofindustrie Soesterberg: *See*—
van Olst, Gijsbrecht H. J., 4,451,032, Cl. 272-56.5SS.
Neenan, Thomas X.: *See*—
Allcock, Harry R.; and Neenan, Thomas X., 4,451,647, Cl. 536-21.000.
Neese, Wayne E., to GTE Automatic Electric Inc. Switching device for thick/thin film circuits. 4,451,715, Cl. 200-11.00G.
Nelson, Carl T., to National Semiconductor Corporation. Bilateral zener trim. 4,451,839, Cl. 357-13.000.
Nelson Industries, Inc.: *See*—
Khosropour, Mostafa M.; and Learn, Thomas C., 4,450,932, Cl. 181-211.000.
Nelson, Norvell J., to PSI Star, Inc. Process and structure for etching copper. 4,451,327, Cl. 156-646.000.
Nelson, Peter C.: *See*—
Klee, David J.; and Nelson, Peter C., 4,451,002, Cl. 236-101.00R.
Nelson, Thomas A.: *See*—
McCain, William B.; and Nelson, Thomas A., 4,451,031, Cl. 271-303.000.
Nemeskeri, Georg, to S. C. Johnson & Son, Inc. Method for high frequency welding flangeless thermoplastic shells. 4,451,721, Cl. 219-10.430.
Nemoto, Hiroshi; Miyachi, Kazuaki; and Komoda, Akira, to Kawasaki Steel Corporation. Electrode support device for continuous electroplating bath. 4,451,345, Cl. 204-206.000.
Nepela, Daniel A.: *See*—
DePalma, Vincent M.; Dilley, Reginald J.; Doerner, Mary F.; and Nepela, Daniel A., 4,451,532, Cl. 428-336.000.
Nestegard, Sander C. Upper body exerciser for a stationary bicycle and a bicycle including the same. 4,451,033, Cl. 272-73.000.
Nettekoven, William S., to Medtronic, Inc. Device for testing heart valve prostheses. 4,450,710, Cl. 73-37.000.
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Ostlinning, Edgar; Idel, Karsten; Neuner, Otto; and Bottenbruch, Ludwig, 4,451,644, Cl. 528-388.000.
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Nevitt, Thomas D.; and Jerome, Norman F., to Standard Oil Company (Indiana). Process to convert C_2-C_3 olefins to a gasoline blending stock. 4,451,685, Cl. 585-415.000.
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Subramanyam, Vinayakam, 4,451,450, Cl. 424-1.100.
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Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, 4,451,478, Cl. 424-273.00R.
Newton, Kevin H.: *See*—
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NGK Insulators, Ltd.: *See*—
Furuta, Mamoru; Maeno, Yoshio; and Kobayashi, Kazuo, 4,451,418, Cl. 264-63.000.
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Yamashita, Mitsuyasu; Igarashi, Hiroshi; and Koga, Shosuke, 4,450,931, Cl. 181-198.000.
NGK Spark Plug Co., Ltd.: *See*—
Ichikawa, Sadao, 4,450,811, Cl. 123-425.000.
NI Industries, Inc.: *See*—
Krause, Charles J., 4,451,528, Cl. 428-287.000.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,451,880, Cl. 364-200.000.
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Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, 4,451,011, Cl. 242-71.000.
Nicolas, Francois: *See*—
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Niederer, Peter G.; and Frey, Otto, to Sulzer Brothers Limited. Joint socket for a hip joint prosthesis. 4,450,592, Cl. 3-1.912.
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Atkins, Ronald L.; Hollins, Richard A.; Norris, William P.; Nielsen, Arnold T.; and Wilson, William S., 4,451,681, Cl. 568-932.000.
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Nilsen, Norman P.; and Novey, Richard T., to CTB, Inc. Cup waterer and cage mount. 4,450,789, Cl. 119-18.000.
Ninomiya, Hisakazu: *See*—
Nagase, Hiroshi; Ninomiya, Hisakazu; and Ibori, Satoshi, 4,451,771, Cl. 318-800.000.
Nippon Electric Co., Ltd.: *See*—
Ikeda, Hiroaki, 4,451,906, Cl. 365-205.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoyama, Kikuro, 4,450,747, Cl. 84-220.000.
Nakada, Akira; and Adachi, Takeshi, 4,450,745, Cl. 84-1.190.
Sugiura, Toshio, 4,450,742, Cl. 84-1.030.
Yokoyama, Kenji, 4,451,798, Cl. 330-254.000.
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Nippon Kinzoku Co., Ltd.: *See*—
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Nippon Kogaku K.K.: *See*—
Maida, Osamu, 4,451,150, Cl. 354-173.110.
Takagi, Tadao; and Okabe, Nobuo, 4,451,729, Cl. 250-204.000.
Nippon Kokan Kabushiki Kaisha: *See*—
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Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.
Nippon Oil Company, Limited: *See*—
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Nippon Soken, Inc.: *See*—
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Inoguchi, Kazuhiro; Okamoto, Kunio; and Isomura, Keiichiro, 4,451,517, Cl. 428-116.000.
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Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,681, Cl. 60-286.000.
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Nippon Television Industry Corporation: *See*—
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Nippon Zeon Co., Ltd.: *See*—
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Nippondenso Co., Ltd.: *See*—
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Nishimura, Eiichi; Uchida, Shunsuke; Kitamura, Masao; Saito, Koichi; Ibe, Eishi; and Hayashi, Tatsuo, to Hitachi, Ltd. Control rods and method of producing same. 4,451,428, Cl. 376-333.000.
Nishimura, Yutaka; Ohyama, Yoshishige; and Sugiura, Noboru, to Hitachi, Ltd. Air flow meter. 4,450,719, Cl. 73-204.000.
Nishioka, Akira; and Kawanabe, Yoshihiro, to Pioneer Electronic Corporation. Input bias adjustment circuit for amplifier. 4,451,800, Cl. 330-261.000.
Nishioka, Goro: *See*—
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Nissan Motor Co., Ltd.: *See*—
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Hayashi, Yoshimasa, 4,450,709, Cl. 73-35.000.
Iijima, Tetsuya; and Takahashi, Seiichi, 4,450,897, Cl. 165-2.000.
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Nitta, Masao. Liquefied gas lighter with ball-pointed pen. 4,451,229, Cl. 431-253.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Kawazoe, Shiyouzou; Ueda, Zenichi; Sugimoto, Toshihiko; and Moriuchi, Takahiko, 4,451,525, Cl. 428-213.000.
Nix, Ceoma. Mobility aid. 4,451,080, Cl. 297-4.000.
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Noel, Stan L., to Ampex Corporation. Magnetic video head position control. 4,451,859, Cl. 360-75.000.
Noeller, Hans G. Polarization fluoroimmunoassay apparatus. 4,451,149, Cl. 356-317.000.
Nohara, Mayumi: *See*—
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Nolte, Hans-Henning, to BFG Glassgroup. Method of forming a laminated fire screening panel. 4,451,312, Cl. 156-99.000.
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NSK Warner Kabushiki Kaisha: *See*—
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Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., to Uniroyal, Inc. Activators for Ziegler type polymerization catalysts using bis(trichloromethyl) sulfone. 4,451,575, Cl. 502-122.000.
Nugent, William A., to Du Pont de Nemours, E. I., and Company. Process for dimerizing acrylates and methacrylates. 4,451,665, Cl. 560-202.000.
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Hansen, Helge; Nystrom, Borje; and Torneng, Eyvin, 4,451,460, Cl. 424-238.000.
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O'Brien, John V., to Koch Process Systems, Inc. Distillative separation of methane and carbon dioxide. 4,451,274, Cl. 62-17.000.
Occidental Chemical Corporation: *See*—
Ranade, Gautam R., 4,451,664, Cl. 560-86.000.
OCLC Online Computer Library Center, Incorporated: *See*—
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O'Connell, William F., to Graco Inc. Electrostatic spray support. 4,450,954, Cl. 198-793.000.
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Off, Joseph W. A.; and Early, Judson H., to Haggar Company. System for prefabricating pocket welts and facing strips. 4,451,318, Cl. 156-353.000.
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Ogasawara, Hiroomi. Non-contact type microdisplacement meter. 4,451,780, Cl. 324-61.00R.
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Oh, Chan S.; and Kramer, Gordon, to Beckman Instruments, Inc. Multicompartment electro-optic display device. 4,451,122, Cl. 350-334.000.
O'Hare, Louis R. Nitrogen fixation by plasma and catalyst. 4,451,436, Cl. 422-186.290.
O'Hare, Thomas J. Mobile pushing exerciser. 4,451,037, Cl. 273-55.00R.
Ohgami, Masaaki; and Matsui, Fujio, to Fuji Jukogyo Kabushiki Kaisha. Control system. 4,451,793, Cl. 328-69.000.
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Okabe, Nobuo: *See*—
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Okada, Takashi; and Tanaka, Yutaka, to Sony Corporation. Television receiver including a circuit for doubling line scanning frequency. 4,451,848, Cl. 358-140.000.
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Okoma Maschinenfabrik GmbH: *See*—
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Okuda, Kensuke; Nagai, Hiroai; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing an artificial dental root. 4,451,235, Cl. 433-201.000.

Okumura, Masanobu, to Olympus Optical Company Limited. Toner concentration detecting device. 4,451,135, Cl. 355-3.0DD.

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Deininger, J. Paul; and Dotson, Ronald L., 4,451,338, Cl. 204-86.000.
Kircher, Morton S., 4,451,346, Cl. 204-228.000.
Owens, William F., 4,450,847, Cl. 131-365.000.
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,450,890, Cl. 164-452.000.

Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Carbamate intermediates for bronchospasmolytics. 4,451,663, Cl. 560-29.000.

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Olyphant, Murray, Jr., to Minnesota Mining and Manufacturing Company. Conformable metal-clad laminate. 4,451,527, Cl. 428-220.000.

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Onaka, Hidemi; and Uchitani, Nobuki, to Toyota Jidosha Kabushiki Kaisha. Ignition timing control system for an internal-combustion engine. 4,450,809, Cl. 123-421.000.

Onken, Donald R.; and Griffin, Robert L. Truck having equipment for on-site heating and collecting used grease from containers. 4,450,828, Cl. 126-343.50A.

Ono, Masaaki; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, to Fujitsu Limited. Surface acoustic wave filter. 4,451,805, Cl. 333-195.000.

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Oowada, Tetsuya, to Nippon Kinzoku Co., Ltd.; and NSK Warner Kabushiki Kaisha. Buckle for seat belt. 4,450,604, Cl. 24-652.000.

Opitz, Heinrich; Montag, Bernhard; Urban, Gerd; and Turk, Wilfried, to Siemens Aktiengesellschaft. Method and apparatus for heat exchange at solid surfaces. 4,450,896, Cl. 165-1.000.

Oppermann, Wilhelm: *See*—
Teubner, Helwig; and Oppermann, Wilhelm, 4,451,649, Cl. 536-111.000.

Oppitz, Peter; Schulze-Braucks, Manfred; and Tesche, Rolf, to Hoechst Aktiengesellschaft. Process for dyeing and finishing tubular textile material: alignment of flattened edges displaced to avoid edge markings. 4,451,263, Cl. 8-500.000.

Oppy, John T.: *See*—
Dell, William J.; Gonsalves, Alexander A.; Flango, William E.; Guhl, Thomas E.; Freed, Lawrence H.; Oppy, John T.; Baratta, Suzanne; and Eydt, Andre J., 4,451,492, Cl. 426-564.000.

Orcutt, Donald R., to Babcock & Wilcox Company, The. Fiber pipe protection for water cooled pipes in reheat furnaces. 4,450,872, Cl. 138-149.000.

Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., to National Slag Limited. Apparatus for the pelletization of heat-liquifiable solid materials. 4,451,221, Cl. 425-8.000.

Orlando, Fred J., Jr.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Des-serine^2-des-tyrosine^{22} calcitonin. 4,451,395, Cl. 260-112.50T.

Osaka Oxygen Industries Ltd.: *See*—
Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.

O'Shaughnessy, Brenda: *See*—
O'Shaughnessy, Kevin, 4,450,712, Cl. 73-61.00R.

O'Shaughnessy, Kevin, to O'Shaughnessy, Brenda. Pulp consistancy measurement. 4,450,712, Cl. 73-61.00R.

Osterberg, Daniel. Hydraulic flow distributor in gold separator and method. 4,451,359, Cl. 209-158.000.

Ostergren, William F.; and Ipnar, Albert J., to Sperry Corporation. Flail head. 4,451,004, Cl. 239-658.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,450,841, Cl. 128-632.000.

Osterholm, Jewell L., to Thomas Jefferson University. Stroke treatment utilizing extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,451,251, Cl. 604-24.000.

Ostkamp, Willi; Brunner, Karlheinz; and Wibbelt, Friedrich, to Westfalia Separator AG. Continuous, completely jacketed, countercurrent centrifugal extractor. 4,451,247, Cl. 494-52.000.

Ostlinning, Edgar; Idel, Karsten; Neuner, Otto; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Process for the production of polyarylene (sulphi-es) having an increased thermal and chemical resistance and an improved color quality. 4,451,644, Cl. 528-388.000.

Ostroff, Stuart S.; and Bevan, William G., to General Battery Corporation. Method and apparatus for electrically testing elements of multicell batteries. 4,451,791, Cl. 324-434.000.

Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, to Exxon Research and Engineering Co. Trihydrocarbyl silyl substituted alkyl diaryl phosphine transition metal complexes and their use as homogeneous isomerization hydroformylation catalysts. 4,451,673, Cl. 568-454.000.

Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,450,607, Cl. 28-257.000.

Otani, Junji; Ikenoya, Yasuo; and Kato, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas cleaning system for internal combustion engine. 4,450,684, Cl. 60-290.000.

Otsuka Chemical Co., Ltd.: *See*—
Shibuta, Osamu; Hasegawa, Tetuo; and Ogawa, Jun, 4,451,410, Cl. 260-973.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Maekawa, Tsukasa; and Gondo, Takeshi, 4,451,662, Cl. 549-462.000.

Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system for internal combustion engines, having secondary air supply control. 4,450,680, Cl. 60-274.000.

Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Electric control system for internal combustion engines, having fail safe function for engine condition detecting sensors. 4,450,812, Cl. 123-438.000.

Ottersbach, Jens: *See*—
Beckmann, Heinrich; Ottersbach, Jens; Roider, Willibald; and Saumweber, Eckart, 4,451,889, Cl. 364-426.000.

Outokumpu Oy: *See*—
Leiponen, Matti O., 4,451,291, Cl. 75-73.000.

Ovren, Christer: *See*—
Brogardh, Torgny; Engstrom, Olof; and Ovren, Christer, 4,451,730, Cl. 250-227.000.

Owens-Corning Fiberglas Corporation: *See*—
Black, Denny E.; Garrett, David W.; and Coakley, Thomas A., 4,451,592, Cl. 523-206.000.
Campbell, Leslie E., 4,451,594, Cl. 523-336.000.
Uffner, William E.; and White, Robert N., 4,451,171, Cl. 404-31.000.

Owens-Illinois, Inc.: *See*—
Mumford, Eustace H., 4,450,741, Cl. 83-623.000.

Owens, William F., to Olin Corporation. Wrapper for smoking articles and method. 4,450,847, Cl. 131-365.000.

Oyabu, Nobuya: *See*—
Inomata, Takehiro; and Oyabu, Nobuya, 4,450,766, Cl. 101-183.000.

Oye, Toshimi. Dental articulator device. 4,451,234, Cl. 433-54.000.

Padalka, Valentin G.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Pailler, Yves. Two stroke engine. 4,450,794, Cl. 123-74.00R.

Paillet, Bernard, to Compagnie Francaise d'Emballages et de Conditionnement - COFREC. Container for pharmaceutical ampules or the like. 4,450,965, Cl. 206-528.000.

Palensky, Frederick J.: *See*—
Heilmann, Steven M.; Rasmussen, Jerald K.; and Palensky, Frederick J., 4,451,619, Cl. 525-379.000.

Palermo, David W.; Ricci, David W.; Marriott, Joe E.; and Heger, Thomas J., to Hewlett-Packard Company. Asynchronous interface message transmission using source and receive devices. 4,451,898, Cl. 364-900.000.

Panchokha, Vasily P.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Pandelena, Michael N.; and Strozza, Peter. Annular drip collector and cap. 4,451,368, Cl. 210-238.000.

Papathomas, Thomas V.; Scuderi, Rudolph, deceased; by White, May S., co-executrix; and by D'Ambrose, Camille, co-executrix, to Bell Telephone Laboratories, Incorporated. Rectifier control system for a DC power plant system. 4,451,773, Cl. 320-59.000.

Parkinson, Ward: *See*—
Philofsky, Elliott; Parkinson, Ward; and Wilson, Dennis, 4,451,845, Cl. 357-72.000.

Parma, Agustin M. Internal combustion engines and rotary volumetric compressors. 4,450,802, Cl. 123-245.000.

Paroczai, Margit: *See*—
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.
Parron, Ivan: *See*—
Rosenthal, Michael R.; and Parron, Ivan, 4,450,655, Cl. 52-36.000.
Parsons, Jack L.; Vizine, Dan; Sumner, Mark; Marathe, Suresh; and Dubicki, Henryk, to United States of America, Health and Human Services. Process for the production of 2-β-D-ribofuranosylthiazole-4-carboxamide. 4,451,648, Cl. 536-54.000.
Pasetti, Adolfo: *See*—
Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, 4,451,646, Cl. 528-401.000.
Pask, George, to Rolls-Royce Limited. Aerofoil blade mounting. 4,451,204, Cl. 416-215.000.
Pasky, Joseph Z., to Chevron Research Company. Co-oligomerization of olefins. 4,451,684, Cl. 585-329.000.
Pasky, Joseph Z., to Chevron Research Company. Co-dimerization of olefins. 4,451,689, Cl. 585-525.000.
Paterson, Laurene O. Apparatus for removing dissolved iron from water. 4,451,361, Cl. 210-136.000.
Patisaul, Charles R.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.
Patsch, Manfred; and Ruske, Manfred, to BASF Aktiengesellschaft. Dyes containing imidazolymethylene groups. 4,451,398, Cl. 260-154.000.
Patton, Paul B.: *See*—
Landis, William R.; and Patton, Paul B., 4,451,225, Cl. 431-14.000.
Landis, William R.; and Patton, Paul B., 4,451,226, Cl. 431-15.000.
Landis, William R.; and Patton, Paul B., 4,451,227, Cl. 431-18.000.
Paurat, Friedrich W.; and Paurat, Roland. Coal-mining machine. 4,451,089, Cl. 299-43.000.
Paurat, Roland: *See*—
Paurat, Friedrich W.; and Paurat, Roland, 4,451,089, Cl. 299-43.000.
Pawloski, Chester E., to Dow Chemical Company, The. Heterocyclic substituted triazolyl phosphorous compounds. 4,451,653, Cl. 544-238.000.
Payne, Charles C., to Nalco Chemical Company. Preparation of aluminum oxide coated silica sols using ultrafiltration. 4,451,388, Cl. 252-313.00S.
Payne, Charles L. Tool for use in line boring of diesel engine blocks. 4,451,186, Cl. 408-54.000.
Payne, Frank A.: *See*—
D'Augustine, Frank T.; Terry, Malcolm E.; Welsh, Hugh F.; and Payne, Frank A., 4,451,243, Cl. 445-68.000.
PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Bourson, Lucien; Delavarenne, Serge; and Tellier, Pierre, 4,451,333, Cl. 162-77.000.
Calas, Patrick; Moreau, Patrice; and Commeyras, Auguste, 4,451,682, Cl. 570-142.000.
Pechiney: *See*—
Maurel, Pierre; Bosca, Bernard; and Nicolas, Francois, 4,451,439, Cl. 423-55.000.
Peck, William H. Apparatus for separating liquid from a slurry. 4,451,371, Cl. 210-325.000.
Pedginski, James J.: *See*—
Wong, Roy; Pedginski, James J.; and Wong, Andrew H., 4,451,533, Cl. 428-337.000.
Penn, Paul E.; and Waymire, John W., to Dart Controls, Inc. Overload sensing circuit for a motor. 4,451,823, Cl. 340-648.000.
Penta-Ocean Construction Co., Ltd.: *See*—
Yamashita, Hiromichi; Watari, Yoshiharu; Mutsuro, Hideaki; and Takagi, Kenji, 4,451,175, Cl. 405-50.000.
Pentanyl Technologies, Inc.: *See*—
Porter, Clifford R.; and Kaesz, Herbert D., 4,451,351, Cl. 208-10.000.
Perez, Robert. Tool for scarifying concrete. 4,451,093, Cl. 299-88.000.
Perie, Daniel: *See*—
Levos, Christian; Perie, Daniel; and Gex, Jean-Francois, 4,450,730, Cl. 73-864.610.
Perkins, Robert D. Tricycle. 4,451,064, Cl. 280-259.000.
Pesa, Frederick A.; and Haase, Thomas A., to Standard Oil Company, The. Carbonylation of olefinically unsaturated compounds. 4,451,407, Cl. 260-465.400.
Peterson, Andrew F.: *See*—
Chapman, Ronald H.; and Peterson, Andrew F., 4,451,930, Cl. 455-260.000.
Peterson, Bruce W.: *See*—
Speranza, George P.; Cuscurida, Michael; and Peterson, Bruce W., 4,451,588, Cl. 521-175.000.
Peterson, Dennis P.; and Davis, James C., to Dow Chemical Company, The. Liquid chromatographic method and post-column effluent treatment for detection and separation at optimized pH. 4,451,374, Cl. 210-656.000.
Petit, William A.: *See*—
Smith, Barry L.; and Petit, William A., 4,451,018, Cl. 246-122.00R.
Petrov, Georgi M.; Boev, Kiril K.; Fidelski, Igor A.; and Pirgov, Yordan T., to Institute PO Obleklo I Textil. Method of and apparatus for the production of fancy yarns. 4,450,675, Cl. 57-6.000.
Petty, William E., Sr. Gate latch. 4,451,072, Cl. 292-128.000.
Pews, Richard G.: *See*—
Buske, Gary R.; and Pews, Richard G., 4,451,408, Cl. 260-505.00R.
Buske, Gary R.; and Pews, Richard G., 4,451,409, Cl. 260-513.00R.
Pfaller, Egon: *See*—
Winkler, Ottmar; and Pfaller, Egon, 4,451,215, Cl. 418-23.000.
Pfizer Inc.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,451,472, Cl. 424-263.000.
Cue, Berkeley W., Jr., 4,451,655, Cl. 546-85.000.
Weeks, Paul D.; and Allingham, Robert P., 4,451,661, Cl. 549-417.000.
Pharmindustrie: *See*—
Dubroeucq, Marie-Christine; and Ratand, Jean E. M. A., 4,451,461, Cl. 424-246.000.
Phelps, Barry C.: *See*—
Hall, John S.; and Phelps, Barry C., 4,451,068, Cl. 283-75.000.
Phelps, Richard W., to Black Clawson Company, The. Paper machine drying section. 4,450,630, Cl. 34-116.000.
Philippe, Jean-Jacques; and Lyothier, Robert M., to Office Nationale d'Etudes et de Recherches Aerospatiales; and Societe Nationale Industrielle Aerospatiale. Blade end for rotary wing of an aircraft and rotary wing provided with such blade ends. 4,451,206, Cl. 416-228.000.
Phillipps, Gordon H.; Humber, David C.; Ewan, David B.; and Coomber, Barry A., to Glaxo Group Limited. 11α-Amino-3β-hydroxy-androstanes. 4,451,405, Cl. 260-397.100.
Phillips, Edward H., to Hidden Valley Associates, Inc. Method and apparatus for pumping subterranean fluids. 4,451,209, Cl. 417-38.000.
Phillips, Graham R.; and Prudot, Norvell G., to Century Electric, Inc. Motor/generator starting circuit. 4,451,775, Cl. 322-10.000.
Phillips Petroleum Company: *See*—
Blackwell, Jennings P., 4,451,601, Cl. 524-263.000.
Clear, Elmer E., 4,451,389, Cl. 252-315.300.
Edmonds, James T., Jr.; and Sherk, Fred T., 4,451,643, Cl. 528-387.000.
Garcia, Rodrigo A.; and Martinovich, Robert J., 4,451,607, Cl. 524-494.000.
Hitzman, Donald O., 4,450,908, Cl. 166-246.000.
Mills, Kenneth R., 4,451,604, Cl. 524-312.000.
Murray, Lawrence K., 4,451,231, Cl. 432-13.000.
Scott, Richard L., 4,450,723, Cl. 73-432.0PS.
Volz, Herbert A., 4,450,904, Cl. 165-162.000.
Wiley, Bruce F., 4,450,717, Cl. 73-151.000.
Philofsky, Elliott; Parkinson, Ward; and Wilson, Dennis, to AVX Corporation. Lead frame device including ceramic encapsulated capacitor and IC chip. 4,451,845, Cl. 357-72.000.
Photomatrix Corporation: *See*—
Gensike, Karl H., 4,451,144, Cl. 355-99.000.
Pick, Steve J. High speed shaft seal. 4,451,048, Cl. 277-27.000.
Pickios, Anthony G. Method of fabricating a hand calculator. 4,450,615, Cl. 29-437.000.
Pieper, Friedrich: *See*—
Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, 4,451,261, Cl. 8-94.220.
Piesch, Steffen; and Dorries, Peter, to Cassella Aktiengesellschaft. Diethanolamine salt of sulphamic acid as a curing accelerator for aminoplast resins. 4,451,620, Cl. 525-398.000.
Pieters, Wim J.M.; and Prilutski, Gerard M., to Exxon Research and Engineering Co. Catalytic dehydroxylation of phenols. 4,451,356, Cl. 208-263.000.
Pingaud, Bernard J.; and Poncet, Claude, to Eastman Kodak Company. Magnetic recording elements, process for making the same and their use in recording. 4,451,535, Cl. 428-329.000.
Pinnow, Douglas A.; Gentile, Anthony L.; Standlee, Arlie G.; and Timper, Arthur J., to Hughes Aircraft Company. Infrared transmitting fiber optical waveguide extruded from halides of the metal thallium and the method of preparation. 4,451,116, Cl. 350-96.340.
Pioneer Electronic Corporation: *See*—
Kawahara, Fumio; Takahashi, Masanori; and Kumagai, Katsuyoshi, 4,451,609, Cl. 524-708.000.
Koinuma, Hirosi, 4,451,802, Cl. 330-297.000.
Murayama, Fumio, 4,451,928, Cl. 381-86.000.
Nishioka, Akira; and Kawanabe, Yoshihiro, 4,451,800, Cl. 330-261.000.
Pirgov, Yordan T.: *See*—
Petrov, Georgi M.; Boev, Kiril K.; Fidelski, Igor A.; and Pirgov, Yordan T., 4,450,675, Cl. 57-6.000.
Pittsburgh-Des Moines Corporation: *See*—
Hills, Richard E., 4,450,855, Cl. 137-312.000.
Plastics Engineering Company: *See*—
D'Alelio, Gaetano F.; and Waitkus, Phillip A., 4,451,669, Cl. 562-442.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,451,402, Cl. 548-461.000.
Plummer, Ernest L., to FMC Corporation. Insecticidal 2,2'-bridged[1,1'-biphenyl]-3-ylmethyl esters. 4,451,484, Cl. 424-305.000.
PMC Corporation: *See*—
Wilson, Donald C., 4,450,760, Cl. 99-536.000.
Polaroid Corporation: *See*—
Gerber, Arthur M.; and Loucks, Judith, 4,451,560, Cl. 430-567.000.
Poler, Stanley, to Lynell Medical Technology Inc. Intraocular and contact lens construction. 4,450,593, Cl. 3-13.000.
Pollaert, Hendricus J. P. M.: *See*—
Bos, Johannes G. G.; Pollaert, Hendricus J. P. M.; and Sijben, Johannes L. H., 4,450,674, Cl. 57-6.000.

Pollet, Robert J.; Vandenberghe, Antoon L.; and Spriet, Roger A., to AGFA-GEVAERT, N.V. Antifogging compounds and their use in silver halide photography. 4,451,555, Cl. 430-445.000.

Pomerleau, Andre; and Brousseau, Jean-Francoys, to Universite Laval. Electronic chronometer. 4,451,896, Cl. 364-569.000.

Pommerrenig, Dieter H., to Rockwell International Corporation. Large scale integrated focal plane. 4,451,842, Cl. 357-30.000.

Poncet, Claude: *See*—
Pingaud, Bernard J.; and Poncet, Claude, 4,451,535, Cl. 428-329.000.

Pool Company: *See*—
Lorenz, Howard L., 4,451,183, Cl. 406-94.000.

Popov, Marin A.; and Georgiev, Todor G., to Knipsm "Zavodproekt". Water resistant and heat insulating material and method of making same. 4,451,294, Cl. 106-75.000.

Portec, Inc.: *See*—
Smith, Ryan M.; and Stoller, David A., Sr., 4,451,188, Cl. 410-42.000.

Porter, Clifford R.; and Kaesz, Herbert D., to Pentanyl Technologies, Inc. Method of liquefaction of carbonaceous materials. 4,451,351, Cl. 208-10.000.

Posso, Patrick, to Gefitec S.A. Platform for a camera or cine camera stand. 4,451,020, Cl. 248-183.000.

Potaichuk, Vladimir M.: *See*—
Erasov, Fedor N.; Chumachenko, Boris A.; and Potaichuk, Vladimir M., 4,451,216, Cl. 418-61.00B.

Potter, Craig W.: *See*—
Colburn, Lyle W.; Potter, Craig W.; and Romesberg, Floyd E., 4,450,977, Cl. 220-458.000.

Potters, Cornelis J. T.: *See*—
Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Tholen, Antonius H. L., 4,451,115, Cl. 350-96.180.

Potts, Kevin T., to Rensselaer Polytechnic Institute. Method of making known and previously unavailable pyrylium salts. 4,451,659, Cl. 549-4.000.

Prasad, Arun, to Jeneric Industries, Inc. Self-actuated dental capsule. 4,450,958, Cl. 206-222.000.

Prasad, Arun, to Jeneric Industries, Inc. Dental alloys for porcelain-fused-to-metal restorations. 4,451,639, Cl. 420-464.000.

Pratscher, Andrew J. Industrial rodent killing device. 4,450,648, Cl. 43-64.000.

Pratt, John D., to Monogram Industries, Inc. Bulb rivet. 4,451,189, Cl. 411-34.000.

Precision Metal Fabricators, Inc.: *See*—
Lenhart, Ronald A., 4,451,182, Cl. 406-86.000.

Premix, Inc.: *See*—
Collister, Jon E., 4,451,610, Cl. 525-19.000.

Prescott, Ernest; and Cochran, William C., to Aluminum Company of America. Aluminum nitriding by laser. 4,451,302, Cl. 148-13.100.

Presto Lock, Inc.: *See*—
Scelba, Stephen S., 4,450,698, Cl. 70-312.000.

Prewo, Karl M.: *See*—
Stalcup, Robert K.; Sigman, Warren R.; and Prewo, Karl M., 4,451,118, Cl. 350-310.000.

Prilutski, Gerard M.: *See*—
Pieters, Wim J.M.; and Prilutski, Gerard M., 4,451,356, Cl. 208-263.000.

Prodinger, Arnold, to U.S. Philips Corporation. Magnetic-tape cassette. 4,451,864, Cl. 360-130.330.

Prohaska, Werner; and Romann, Peter, to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium. 4,450,714, Cl. 73-118.100.

Prudot, Norvell G.: *See*—
Phillips, Graham R.; and Prudot, Norvell G., 4,451,775, Cl. 322-10.000.

Pryde, Everett H.: *See*—
Schwab, Arthur W.; and Pryde, Everett H., 4,451,267, Cl. 44-53.000.

PSI Star, Inc.: *See*—
Nelson, Norvell J., 4,451,327, Cl. 156-646.000.

Pugh, Paul F. Battery system. 4,451,877, Cl. 363-59.000.

Pulver, John C.: *See*—
Meyers, John J.; and Pulver, John C., 4,451,119, Cl. 350-310.000.

Puri, Yogi K.: *See*—
Dearden, Ziba T.; and Puri, Yogi K., 4,451,922, Cl. 371-49.000.

Purity Packaging Corporation: *See*—
Cauldwell, Jack D., 4,451,309, Cl. 156-64.000.

Puryear, John W.; and Callan, Arthur D., to Brunswick Corporation. Fishing line control device. 4,451,012, Cl. 242-84.20A.

Quaker Oats Company, The: *See*—
Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., 4,451,488, Cl. 426-89.000.
Coss, William W., 4,451,577, Cl. 502-167.000.

Quarendon, Peter: *See*—
Hall, Stephen T.; Hardiman, Raymond; Johnson, Peter W.; Quarendon, Peter; and Tuffill, Harold W., 4,451,825, Cl. 340-750.000.

Quick, Donald J., to Massey-Ferguson Services N.V. Sugar cane billet planter. 4,450,778, Cl. 111-3.000.

Quigley Company, Inc.: *See*—
Kitamura, Minoru; Soejima, Toshiyuki; Hayashi, Tsutomu; Matsui, Hideo; and Fujisawa, Shigenori, 4,451,293, Cl. 75-257.000.

Quisno, Robert A., to Hill Top Research, Inc. Patch system for use on the skin. 4,450,844, Cl. 128-743.000.

R.M.S. Ingenierie et Financiere: *See*—
Alexandre, Claude, 4,450,922, Cl. 177-211.000.

R. T. French Co., The: *See*—
Hotchkin, Peter, 4,450,594, Cl. 4-228.000.

Rabitsch, Hermann: *See*—
Raggam, Augustin; and Rabitsch, Hermann, 4,451,331, Cl. 162-18.000.

Rachner, Horst: *See*—
Kohler, Alfred; and Rachner, Horst, 4,451,768, Cl. 318-443.000.

Raggam, Augustin; and Rabitsch, Hermann, to Simmering-Graz-Pauker Aktiengesellschaft. Process and apparatus for producing pulp. 4,451,331, Cl. 162-18.000.

Rajagopal, Ganesh: *See*—
Basrai, Habil S.; and Rajagopal, Ganesh, 4,450,753, Cl. 91-35.000.

Rakoczi, Istvan: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Rakoczy, Bohdan: *See*—
Fickes, Michael G.; and Rakoczy, Bohdan, 4,451,553, Cl. 430-306.000.

Ramachandran, Sundaresan: *See*—
Kennedy, Robert J., Sr.; Kennedy, Robert J., Jr.; and Ramachandran, Sundaresan, 4,451,537, Cl. 428-391.000.

Ramras, Daniel M.: *See*—
Santillie, Paul W.; and Ramras, Daniel M., 4,451,444, Cl. 423-480.000.

Ramun, John: *See*—
Ramun, Michael; and Ramun, John, 4,450,625, Cl. 30-134.000.

Ramun, Michael; and Ramun, John, to Allied Gator, Inc. Material handling and shearing attachment for a backhoe. 4,450,625, Cl. 30-134.000.

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Randall, David I., to GAF Corporation. 1-Hydroxyanthrasquinone aquatic herbicide. 4,451,278, Cl. 71-66.000.

Rantapaa, Larry A. Pedal extension device. 4,450,733, Cl. 74-562.000.

Rappaport, Mark J. Internal anti-proratory plug assembly and process of installing the same. 4,450,591, Cl. 3-1.900.

Rapparini, Gino. Line of continuous working packaging machines for rectangular prismatic packages. 4,450,669, Cl. 53-551.000.

Rasmussen GmbH: *See*—
Sauer, Heinz, 4,451,070, Cl. 285-242.000.

Rasmussen, Jerald K.: *See*—
Heilmann, Steven M.; Rasmussen, Jerald K.; and Palensky, Frederick J., 4,451,619, Cl. 525-379.000.

Rataud, Jean E. M. A.: *See*—
Dubroeucq, Marie-Christine; and Rataud, Jean E. M. A., 4,451,461, Cl. 424-246.000.

Ray, Thomas E.: *See*—
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RCA Corporation: *See*—
Beltz, John P.; and Hang, Kenneth W., 4,451,507, Cl. 427-240.000.
D'Augustine, Frank T.; Terry, Malcolm E.; Welsh, Hugh F.; and Payne, Frank A., 4,451,243, Cl. 445-68.000.
Doner, Claude E., 4,451,806, Cl. 333-224.000.
Fuhrer, Jack S., 4,451,849, Cl. 358-161.000.
Fuldner, William V., 4,451,828, Cl. 343-872.000.
Kirschner, Thomas F., 4,451,912, Cl. 369-77.200.
Marinelli, Donald P.; and Ladany, Ivan, 4,451,727, Cl. 219-464.000.
McGlashan, Kenneth W.; and Archer, John R., 4,451,807, Cl. 335-211.000.
Mount, James, 4,451,725, Cl. 219-390.000.
Shanley, Robert L., II, 4,451,840, Cl. 358-22.000.
Weakliem, Herbert A.; and Vossen, John L., Jr., 4,450,787, Cl. 118-723.000.
Welch, Norman D.; and Woestman, John W., 4,451,879, Cl. 364-181.000.

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Reap, James D. Combined time and temperature indicating device. 4,451,157, Cl. 368-11.000.

Reda, Kazimierz J.; Dzewaltowski, Victor F.; Millay, Lawrence I.; and Hobbs, Robert N., to Ex-Cell-O Corporation. Stationary grinding wheel dressing unit. 4,450,651, Cl. 51-5.00D.

Redpath, Thomas W. T.: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,451,788, Cl. 324-309.000.

Regulski, Thomas W.: *See*—
Klun, Robert T.; and Regulski, Thomas W., 4,451,667, Cl. 560-207.000.

Reh, Chuan. Electrical plug. 4,451,102, Cl. 339-74.00R.

Reichmann, Walter: *See*—
Treiber, Josef; and Reichmann, Walter, 4,450,701, Cl. 72-181.000.

Reilly, Laurence W., Jr.: *See*—
Rousseau, Alan D.; and Reilly, Laurence W., Jr., 4,451,613, Cl. 525-54.310.

Reinecke, Paul: *See*—
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.

Reinehr, Ulrich; Herbertz, Toni; and Spilgies, Gunter, to Bayer Aktiengesellschaft. Process for the production of flame resistant moulded polymer articles. 4,451,423, Cl. 264-182.000.

Reiner, Roland: *See*—
Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., 4,451,452, Cl. 424-78.000.
Reinholm, James H.; and Marcinkiewicz, Eugene J., to GSE, Inc. Digital retorque measuring apparatus. 4,450,727, Cl. 73-862.230.
Rembold, Helmut, to Robert Bosch GmbH. Vane-piston pump. 4,451,218, Cl. 418-137.000.
Remington Arms Company, Inc.: *See*—
Bullis, Douglas E.; and Blumer, Kurt, 4,450,641, Cl. 42-6.000.
Rempfler, Hermann: *See*—
Maier, Ludwig; Rempfler, Hermann; and Durr, Dieter, 4,451,284, Cl. 71-94.000.
Remy, Jean-Claude, to Dixi S.A. Usine 4. Tool for truing up grinding wheels. 4,450,826, Cl. 125-11.00N.
Rendelmann, Ulrich: *See*—
Dolezalek, Friedrich; Koepke, Gunther; and Rendelmann, Ulrich, 4,451,497, Cl. 427-39.000.
Rensselaer Polytechnic Institute: *See*—
Potts, Kevin T., 4,451,659, Cl. 549-4.000.
Repella, James A., to Microdot Inc. Method of making a polytetrafluoroethylene hydrodynamic seal. 4,450,614, Cl. 29-417.000.
Repella, James A., to Microdot Inc. Bi-directional hydrodynamic slitted seal. 4,451,050, Cl. 277-134.000.
Research Corporation: *See*—
Allcock, Harry R.; and Neenan, Thomas X., 4,451,647, Cl. 536-21.000.
Research-Cottrell: *See*—
Lefevre, Marcel R., 4,451,411, Cl. 261-111.000.
Retelsdorf, Hans-Joachim: *See*—
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Reuter, Helge H.: *See*—
Frechette, Thomas E.; and Reuter, Helge H., 4,451,166, Cl. 400-208.000.
Reynolds Metals Company: *See*—
Robertson, Field I., Jr.; and Bryan, George D., Jr., 4,450,700, Cl. 72-115.000.
Rheinische Braunkohlenwerke AG: *See*—
Wolfrum, Erhard; Erken, Manfred; and Bocker, Dietrich, 4,450,777, Cl. 110-342.000.
Rheintechnik, Weiland & Kasper KG: *See*—
Weiland, Werner, 4,450,792, Cl. 119-126.000.
Ricard, Paul R.; and Goclowski, Charles, to Arrow Machine, Inc. Hardened metal workpiece straightening machine. 4,450,707, Cl. 72-389.000.
Ricci, David W.: *See*—
Palermo, David W.; Ricci, David W.; Marriott, Joe E.; and Heger, Thomas J., 4,451,898, Cl. 364-900.000.
Richards, Arthur W.: *See*—
Vescovi, Valentino F.; and Richards, Arthur W., 4,451,812, Cl. 336-84.00C.
Richards, Ronald L.: *See*—
Sekmakas, Kazys; and Richards, Ronald L., 4,451,603, Cl. 524-279.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Balazs, Janos; Bano, Tibor; Kollar, Arpad; Kovacs, Tibor; Lengyel, Denes; and Mozer, Ferenc, 4,450,608, Cl. 29-33.08R.
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.
Ricoh Co., Ltd.: *See*—
Hashimoto, Mitsuru; and Sakai, Kiyoshi, 4,451,545, Cl. 430-59.000.
Saito, Kinzi, 4,451,140, Cl. 355-15.000.
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Yanagawa, Nobuyuki; and Kamiyama, Shinichi, 4,451,139, Cl. 355-15.000.
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Anderson, Carl P., 4,451,138, Cl. 355-14.0SH.
Ridenour, Ralph G. Tube fitting assembly method with deformable seal. 4,450,618, Cl. 29-509.000.
Rieman, Willis E.: *See*—
Barry, Leon G.; and Rieman, Willis E., 4,451,814, Cl. 337-407.000.
Riesenberg, Horst; and Krahn, Margot. Survey objective. 4,451,126, Cl. 350-520.000.
Rijckaert, Albert M. A.; Ruyten, Henricus M.; Hoefnagels, Johannes F.; and Schoenmakers, Johannes J. M., to U.S. Philips Corporation. Magnetic head mounting mechanism for automatic azimuth control. 4,451,862, Cl. 360-109.000.
Rim, Yong S.: *See*—
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., 4,451,575, Cl. 502-122.000.
Rimmer, John, to Amersham International plc. Radiopharmaceutical composition based on technetium-99m and reagent for making it. 4,451,451, Cl. 424-1.100.
Riordan, Edward D.: *See*—
Szantho, Charles F.; and Riordan, Edward D., 4,451,722, Cl. 219-86.250.
Roan, Charles F., III. Sodium-free salt substitute. 4,451,494, Cl. 426-649.000.
Robert Bosch GmbH: *See*—
Bubenzer, Wilfried, 4,451,325, Cl. 156-583.100.
Eheim, Franz; and Hofer, Gerald, 4,450,805, Cl. 123-387.000.
Fischer, Werner; and Locher, Johannes, 4,451,778, Cl. 323-282.000.
Grimm, Gerold; Kemmner, Ulrich; Knapp, Heinrich; and Rose, Klaus, 4,450,866, Cl. 137-625.340.
Prohaska, Werner; and Romann, Peter, 4,450,714, Cl. 73-118.100.
Rembold, Helmut, 4,451,218, Cl. 418-137.000.
Sumal, Jaihind S., 4,450,715, Cl. 73-118.100.
Roberts, James E., Jr. Dispensing container. 4,451,164, Cl. 400-196.000.
Robertson, Field I., Jr.; and Bryan, George D., Jr., to Reynolds Metals Company. Method and apparatus for necking and flanging container bodies. 4,450,700, Cl. 72-115.000.
Robertson, James, to Imperial Chemical Industries PLC. Electrically actuable ignition assembly. 4,451,867, Cl. 361-248.000.
Robinson, Richard L. Weed cutter for boat motor. 4,450,670, Cl. 56-8.000.
Rocks, Joseph C. Printing press blanket gauge. 4,450,628, Cl. 33-172.00E.
Rockwell International Corporation: *See*—
Buresh, Lloyd V.; Hammond, Garth D.; Koval, Emil J.; and McCormick, Vernon R., 4,451,103, Cl. 339-93.00R.
Pommerrenig, Dieter H., 4,451,842, Cl. 357-30.000.
Rockwell-Rimoldi S.p.A.: *See*—
Torre, Giancarlo D., 4,451,191, Cl. 414-118.000.
Roehm, Vincent P.: *See*—
Shaubach, Robert M.; Eastman, George Y.; and Roehm, Vincent P., 4,451,210, Cl. 417-52.000.
Roettgen, Leslie A.: *See*—
Thedens, Kevin J.; and Roettgen, Leslie A., 4,450,801, Cl. 123-198.00F.
Rogers, Burton L., to Syntex (U.S.A.) Inc. Pinch valve assembly. 4,450,862, Cl. 137-595.000.
Rogers Corporation: *See*—
Harper, William P.; and DeVries, Donald H., 4,451,694, Cl. 174-72.00B.
Traut, G. Robert, 4,451,833, Cl. 343-872.000.
Roider, Willibald: *See*—
Beckmann, Heinrich; Ottersbach, Jens; Roider, Willibald; and Saumweber, Eckart, 4,451,889, Cl. 364-426.000.
Rolls Royce Limited: *See*—
Langley, Kenneth R., 4,451,203, Cl. 416-215.000.
Pask, George, 4,451,204, Cl. 416-215.000.
Roman, Ian C., to Bend Research, Inc. Absorption process for producing oxygen and nitrogen and solution therefor. 4,451,270, Cl. 55-38.000.
Roman, Steven A.: *See*—
Horne, Charles A.; Salvo, Stephen A.; Sundelin, Kurt G. R.; and Roman, Steven A., 4,451,466, Cl. 424-251.000.
Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Inside adapter for a sample container. 4,451,250, Cl. 494-85.000.
Romann, Peter: *See*—
Prohaska, Werner; and Romann, Peter, 4,450,714, Cl. 73-118.100.
Romesberg, Floyd E.: *See*—
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Romig, William R.: *See*—
Beale, Robert J.; Bradbury, Allen G. W.; Medcalf, Darrell G.; and Romig, William R., 4,451,489, Cl. 426-254.000.
Rose, Klaus: *See*—
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Rosenthal, Michael R.; and Parron, Ivan. Vertically slotted panel. 4,450,655, Cl. 52-36.000.
Ross, Malcolm F.; and Visner, Sidney, to Combustion Engineering, Inc. In-core fuel management for nuclear reactor. 4,451,427, Cl. 376-267.000.
Rossiter, Paul H., to Welding Engineers, Inc. Apparatus and method for controlling extrusion back pressure utilizing a single sleeve die. 4,451,414, Cl. 264-40.500.
Rothenberg, Carl: *See*—
Stangel, John J.; Herper, John C.; and Rothenberg, Carl, 4,451,831, Cl. 343-374.000.
Roubaud, Peter R.: *See*—
Guest, David H.; and Roubaud, Peter R., 4,451,886, Cl. 364-200.000.
Rousseau, Alan D.; and Reilly, Laurence W., Jr., to Minnesota Mining and Manufacturing Company. Ethylenically-unsaturated dextrin oligomers. 4,451,613, Cl. 525-54.310.
Rovira, Felipe P., to D. Felipe Pineda S.A. Method and installation for purifying contaminating water. 4,451,372, Cl. 210-603.000.
Rozniecki, Edward J.; and Wittbrodt, Donald R., to United States of America, Army. Testing system for electro-optical radiation detectors. 4,451,785, Cl. 324-158.00R.
Rucker, Lucien M., III, to Bell Telephone Laboratories, Incorporated. High speed clamp circuit. 4,451,747, Cl. 307-549.000.
Rudolf, Otmar: *See*—
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Ruggeri, Antonio, to Vannucci, Pasquale, a part interest. Sedimentation tank. 4,451,367, Cl. 210-207.000.
Rummel, Theodor: *See*—
Heinemann, Wilfried; and Rummel, Theodor, 4,450,892, Cl. 164-467.000.
Ruschek, Gerhard: *See*—
Sauerschell, Wolfgang; Wietschorke, Stephan; and Ruschek, Gerhard, 4,450,804, Cl. 123-366.000.

Ruske, Manfred: *See—*
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Ruskin, Henry. Staple-driving tools. 4,450,998, Cl. 227-8.000.
Russ, Norman. Easy-frame. 4,450,637, Cl. 40-152.000.
Russell Matthews Industries Limited: *See—*
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Russo, Carmen A., Sr.: *See—*
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Rutledge, Raleigh N.: *See—*
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Ruyten, Henricus M.: *See—*
Rijckaert, Albert M. A.; Ruyten, Henricus M.; Hoefnagels, Johannes F.; and Schoenmakers, Johannes J. M., 4,451,862, Cl. 360-109.000.
Ryan, Bobby W.; Rye, Rufus A.; and Snyder, James L., to WFI International, Inc. Method of manufacturing acute angled vessel connector. 4,450,613, Cl. 29-157.00T.
Ryan, Geoffrey R.: *See—*
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Ryan, Thomas D.: *See—*
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Rye, Rufus A.: *See—*
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Ryston, Ivor; Handley, Harold; Seegmiller, J. Edwin; and Thompson, Linda F., to University of California, The Regents of the. Immunoglobulin-secreting human hybridomas from a cultured human lymphoblastoid cell line. 4,451,570, Cl. 435-240.000.
Ryzhov, Alexei A.: *See—*
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Telenkov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.
S. C. Johnson & Son, Inc.: *See—*
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S.N.E.C.M.A.: *See—*
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Saalmueller, Karl-Heinz: *See—*
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Saccomanno, Geno. Water saving liquid waste disposal system for use with a water closet or the like. 4,450,595, Cl. 4-301.000.
Sacuta, Aleksy, to Alberta Research Council. Combination solvent injection electric current application method for establishing fluid communication through heavy oil formation. 4,450,909, Cl. 166-248.000.
Sadler, Thomas H.; and Dalton, John J., to Manville Service Corporation. Reinforced plastic composite structure. 4,450,873, Cl. 138-174.000.
St. Jean, Herbert N.; and Settanni, Richard, to Cerberus AG. Infrared intrusion sensor with selectable radiation patterns. 4,451,734, Cl. 250-342.000.
St. Joseph Bank and Trust Company, executor: *See—*
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,451,402, Cl. 548-461.000.
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Saito, Koichi: *See—*
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Saito, Tamio, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal recording device. 4,451,835, Cl. 346-76.0PH.
Saito, Yasunori: *See—*
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Sakabe, Yukio; Nishioka, Goro; Azuma, Yoshimasa; and Mori, Susumu, to Murata Manufacturing Co., Ltd. Laminated ceramic capacitor. 4,451,869, Cl. 361-309.000.
Sakai, Fumihide: *See—*
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Sakai, Kiyoshi: *See—*
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Sakai, Masato: *See—*
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Sakamoto, Katsuji; and Saito, Yasunori, to Sumitomo Electric Industries, Ltd. Apparatus for stranding optical fiber cores while slackening them. 4,450,676, Cl. 57-6.000.
Sakano, Kozaburo: *See—*
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Sakshaug, Eugene C.; and Kresge, James S., to General Electric Company. Zinc oxide varistor having reduced edge current density. 4,451,815, Cl. 338-21.000.
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Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Electrical connector device. 4,451,105, Cl. 339-113.00R.
Salmen, Marie P., executrix: *See—*
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Salmen, Richard A., deceased: *See—*
Keyes, Marion A., IV; and Salmen, Richard A., deceased, 4,450,722, Cl. 73-293.000.
Salmi, Robert W., to United States Steel Corporation. Device for removal of magnetic particles from a magnetic separator. 4,451,360, Cl. 209-230.000.
Salvo, Stephen A.: *See—*
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Sanchez, Adon: *See—*
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Sand, Theodor: *See—*
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Sanderson, Edward T. Material handling device. 4,451,198, Cl. 414-779.000.
Sanderson, John R.; and Watts, Lewis W., Jr., to Texaco Inc. Alkane acetates produced by oxidative esterification of olefins over transition metal borates in the presence of acetic anhydride. 4,451,668, Cl. 560-246.000.
Sandoval, E. Jorge, to Hylsa, S.A. Charging system for electric arc furnaces. 4,451,925, Cl. 373-81.000.
Sandoz, Inc.: *See—*
Hardtmann, Goetz E.; and Houlihan, William J., 4,451,448, Cl. 424-251.000.
Hardtmann, Goetz E.; and Houlihan, William J., 4,451,464, Cl. 424-251.000.
Sandoz Ltd.: *See—*
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Deibig, Heinrich; Reiner, Roland; and Weile, Hendricus B. A., 4,451,452, Cl. 424-78.000.
Sanemitsu, Yuzuru; Shiroshita, Masao; Hashimoto, Shunichi; Katoh, Haruhiko; and Matsumoto, Hiroshi, to Sumitomo Chemical Company, Limited. 5-Oxo-2,5-dihydro-1,2,4-triazines. 4,451,283, Cl. 71-93.000.
Sankey, Bruce M.: *See—*
Briens, Cedric L.; Sankey, Bruce M.; and Ewener, Patrick C., 4,451,353, Cl. 208-33.000.
Sankyo Company Limited: *See—*
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Santillie, Paul W.; and Ramras, Daniel M., to Lamb-Weston, Inc. Method and apparatus for producing chlorine dioxide. 4,451,444, Cl. 423-480.000.
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Sarantakis, Dimitrios, to American Home Products Corporation. Dodecapeptides preventing glucose and triglyceride assimilation. 4,451,394, Cl. 260-112.50S.
Sartorius GmbH: *See—*
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Behrend, Lothar; Knothe, Eric; Melcher, Franz-Josef; and Ober, Jurgen, 4,450,924, Cl. 177-212.000.
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Sasaki, Naoaki: *See—*
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Sasaki, Soji: *See—*
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Sasaki, Takashi: *See—*
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Satkunas, Bruno: *See—*
Belinkoff, Irving R.; and Satkunas, Bruno, 4,450,758, Cl. 99-332.000.
Sato, Hiroki; Nakano, Takao; Hatanaka, Masato; Ohhoshi, Toshio; and Tanaka, Sakae, to Sony Corporation. Flat cathode ray tube. 4,451,756, Cl. 313-422.000.

Sato, Hirotaka: *See*—
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Sato, Ichiya: *See*—
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive materials for color photography. 4,451,559, Cl. 430-552.000.
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Sato, Yasutoshi; and Ueno, Keiji, to Sumitomo Electric Industries, Ltd. Heat-shrinkable tubes. 4,450,871, Cl. 138-140.000.
Sato, Yo; and Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Portable label applying machine. 4,451,323, Cl. 156-541.000.
Sattler, Gunther; Gunkel, Werner; Witzgall, Manfred; and Look, Reinhard, to Merck Patent Gesellschaft mit beschrankter Haftung. Column clamping device for chromatography. 4,451,365, Cl. 210-198.200.
Sauer, Heinz, to Rasmussen GmbH. Hose coupling. 4,451,070, Cl. 285-242.000.
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Franck, Klaus; and Sauer, Werner, 4,451,085, Cl. 297-285.000.
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Sauger, Lawrence M. Ready pad for concrete. 4,451,022, Cl. 249-2.000.
Saulson, Stanley H.: *See*—
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Sawamoto, Kunifumi; Morita, Tatsuo; Ikeura, Kenji; and Yamaguchi, Hiroshi, to Nissan Motor Company, Limited. Air-fuel ratio control apparatus and method for an internal combustion engine with a turbocharger. 4,450,814, Cl. 123-478.000.
Sawano, Susumu: *See*—
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Sawheny, Dulari L.: *See*—
Belden, Reed H.; Li, Hsin L.; and Sawheny, Dulari L., 4,450,891, Cl. 164-463.000.
Sawyer, Byron E.: *See*—
Spongr, Jerry J.; and Sawyer, Byron E., 4,451,732, Cl. 250-308.000.
Saylor, Millard P. Apparatus for forming wire connection. 4,450,763, Cl. 100-31.000.
SCA Development Aktiebolag: *See*—
Annergren, Goran E.; Hagglund, Tjell-Ake; Lindblad, Per-Olov; Lindstrom, Lars-Ake T.; and Nasman, Lars E., 4,451,332, Cl. 162-30.100.
Scanlon, Barry. Vehicular airfoils. 4,451,074, Cl. 296-1.00S.
Scelba, Stephen S., to Presto Lock, Inc. Combination locks. 4,450,698, Cl. 70-312.000.
Schaefer, Philipp. Molding compound for molding body portions and process for producing this molding compound. 4,451,584, Cl. 521-54.000.
Schaeffler, Georg; Spiess, Karl; Heyne, Jurgen E.; and Krost, Manfred, to Motomak Motorenbau, Maschinen- Und Werkzeugfabrik, Konstruktionen GmbH. Metal sleeve production. 4,450,704, Cl. 72-356.000.
Schaich, Josef. Four-stroke piston engine. 4,450,795, Cl. 123-79.00C.
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Schaper, Siefried, to Audi Nsu Auto Union Aktiengesellschaft. Method of making a piston. 4,450,610, Cl. 29-156.50R.
Schaty, Harald, to USM Corporation. Pipe clip. 4,450,605, Cl. 24-457.000.
Scheibe, Peter: *See*—
Vetter, Hellmuth; Scheibe, Peter; Thum, Waldemar; and Naher, Gotthilf, 4,451,487, Cl. 435-183.000.
Scheinpflug, Hans: *See*—
Elbe, Hans-Ludwig; Kramer, Wolfgang; Buchel, Karl H.; Lurssen, Klaus; Reinecke, Paul; and Scheinpflug, Hans, 4,451,281, Cl. 71-92.000.
Scheller, Hans U.; and Scheller, Karl A., to Wurttembergische Parfumerie-Fabrik GmbH. Electric toothbrush. 4,450,599, Cl. 15-22.00R.
Scheller, Karl A.: *See*—
Scheller, Hans U.; and Scheller, Karl A., 4,450,599, Cl. 15-22.00R.
Schempp, Heinrich: *See*—
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,451,279, Cl. 71-93.000.
Scheurenbrand, Dieter, to Daimler-Benz Aktiengesellschaft. Filler pipe for a fuel tank. 4,450,880, Cl. 141-285.000.
Schindler, Joachim: *See*—
Struve, Alfred; Hill, Frank F.; and Schindler, Joachim, 4,451,564, Cl. 435-55.000.
Schlumberger Technical Corporation: *See*—
Bell, William T., 4,450,768, Cl. 102-307.000.
Schmidt, Dieter K.: *See*—
Buschor, Josef J.; Long, James C.; and Schmidt, Dieter K., 4,450,949, Cl. 198-422.000.
Schmidt, Earl A. Bait holder for leeches. 4,450,647, Cl. 43-55.000.
Schmidt, Paul J.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,451,657, Cl. 548-456.000.
Schmidt, Robert: *See*—
Knops, Hans-Joachim; Babczinski, Peter; Ese, Ludwig; and Schmidt, Robert, 4,451,282, Cl. 71-92.000.
Schmiedke, Georg: *See*—
Heuer, Dieter; and Schmiedke, Georg, 4,451,750, Cl. 310-88.000.
Schmitz, Hermann: *See*—
Engelhardt, Friedrich; Schmitz, Hermann; Gulden, Walter; and Hax, Jorg, 4,451,631, Cl. 526-287.000.
Schneider, Michel; Chevreux, Pierre; and Guillot, Christian, to Battelle Memorial Institute. Composition for binding bioactive substances. 4,451,568, Cl. 435-181.000.
Schneider, Rolf: *See*—
Kranz, Joachim; Habermann, Wolfgang; Distler, Harry; Knittel, Helmut; Hock, Karl-Ludwig; Brunnmueller, Fritz; and Schneider, Rolf, 4,451,339, Cl. 204-91.000.
Schneider, Thomas G.: *See*—
Klose, George J.; Rosenthal, Janice E.; Schneider, Thomas G.; and Schroeder, Robert F., 4,451,911, Cl. 369-31.000.
Schoch, Daniel A.: *See*—
Olding, Michael J.; and Schoch, Daniel A., 4,450,946, Cl. 192-0.084.
Schoening, Gerhard: *See*—
Floeter, Wilfried; Schoening, Gerhard; and Schroeer, Klaus, 4,451,438, Cl. 423-20.000.
Schoenmakers, Johannes J. M.: *See*—
Rijckaert, Albert M. A.; Ruyten, Henricus M.; Hoefnagels, Johannes F.; and Schoenmakers, Johannes J. M., 4,451,862, Cl. 360-109.000.
Schoenung, Bernhard: *See*—
von Ronai-Horvath, Michael; Schoenung, Bernhard; and Seebo, Kurt, 4,450,677, Cl. 57-81.000.
Schonwald, Siegfried, to Siemens Aktiengesellschaft. Radial piston compressor and drive motor coupling arrangement. 4,451,211, Cl. 417-271.000.
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Klose, George J.; Rosenthal, Janice E.; Schneider, Thomas G.; and Schroeder, Robert F., 4,451,911, Cl. 369-31.000.
Schroeer, Klaus: *See*—
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Schuck, Helmut: *See*—
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Schulz, Donald N.: *See*—
Lohr, Delmar F.; and Schulz, Donald N., 4,451,576, Cl. 502-155.000.
Schulze-Braucks, Manfred: *See*—
Oppitz, Peter; Schulze-Braucks, Manfred; and Tesche, Rolf, 4,451,263, Cl. 8-500.000.
Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Advancing apparatus for coal-mining machine in underground mine. 4,451,090. Cl. 299-43.000.
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Schwab, Arthur W., to United States of America, Agriculture. Diesel fuel-aqueous alcohol microemulsions. 4,451,265, Cl. 44-51.000.
Schwab, Arthur W.; and Pryde, Everett H., to United States of America, Agriculture. Microemulsions from vegetable oil and aqueous alcohol with trialkylamine surfactant as alternative fuel for diesel engines. 4,451,267, Cl. 44-53.000.
Schwenk, Gerhard: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,451,530, Cl. 428-323.000.
SCM Corporation: *See*—
Miller, Donald E.; and Werstak, Charles E., 4,451,493, Cl. 426-602.000.
Scott, Richard L., to Phillips Petroleum Company. Multi-sample surface area measurement. 4,450,723, Cl. 73-432.0PS.
Scovil, Inc.: *See*—
Jones, Arthur L.; and Seeney, Ronald G., 4,451,421, Cl. 264-167.000.
Scuderi, Rudolph, deceased: *See*—
Papathomas, Thomas V.; Scuderi, Rudolph, deceased; White, May S., co-executrix; and D'Ambrose, Camille, co-executrix, 4,451,773, Cl. 320-59.000.
Sealectro Corporation: *See*—
Iantorno, James, 4,450,622, Cl. 29-842.000.
Searl, Alonzo H.; Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Process and apparatus for manufacturing flame retardant flexible foamed articles. 4,451,586, Cl. 521-88.000.
Seebo, Kurt: *See*—
von Ronai-Horvath, Michael; Schoenung, Bernhard; and Seebo, Kurt, 4,450,677, Cl. 57-81.000.

Seegmiller, J. Edwin: *See*—
Ryston, Ivor; Handley, Harold; Seegmiller, J. Edwin; and Thompson, Linda F., 4,451,570, Cl. 435-240.000.

Seeley, Wayne C., to Simmons Universal Corporation. Backrest height adjustment for office chair. 4,451,084, Cl. 297-353.000.

Seeney, Ronald G.: *See*—
Jones, Arthur L.; and Seeney, Ronald G., 4,451,421, Cl. 264-167.000.

Seeq Technology, Inc.: *See*—
Jordan, Larry T., 4,451,903, Cl. 365-94.000.

Seigert, Peter: *See*—
Troeder, Christoph; Faber, Manfred; and Seigert, Peter, 4,450,729, Cl. 73-862.340.

Seiko Instruments & Electronics Ltd.: *See*—
Tanaka, Mitsunori, 4,451,159, Cl. 368-69.000.

Seiler, Norman C.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; and Kawai, Hisasi, to Nippon Soken, Inc. EGR Control system for diesel engine. 4,450,825, Cl. 123-569.000.

Sekino, Masaaki; Fujita, Yoshiyuki; and Ukai, Tetsuo, to Toyo Boseki Kabushiki Kaisha. Fluid separation apparatus. 4,451,369, Cl. 210-321.100.

Sekisui Jushi Kabushiki Kaisha: *See*—
Yui, Ryosuki; Kume, Ketsuke; Hashi, Masaaki; and Niikura, Junji, 4,451,422, Cl. 264-178.00R.

Sekmakas, Kazys; and Richards, Ronald L., to DeSoto, Inc. Abrasion-resistant coatings. 4,451,603, Cl. 524-279.000.

Selenia, Industrie Elettroniche Associate, S.p.A.: *See*—
Diedrich, Heinz K.; Greco, Giovanni; and Fanti, Domenico, 4,451,735, Cl. 250-352.000.

Selkirk, Neil R.: *See*—
Lonseth, Palmer; Selkirk, Neil R.; and Moorby, Donald G., 4,451,870, Cl. 361-433.000.

Selwyn, Stephen; and Ketcham, William P., to Ketcham, William P. Countdown timer. 4,451,158, Cl. 368-63.000.

Senoo, Takanori: *See*—
Wada, Ryoichi; Tsuchiya, Mitsuharu; Senoo, Takanori; and Odagi, Kanji, 4,451,919, Cl. 371-38.000.

Seppo, Seppanen. Flow-operated measuring apparatus. 4,450,726, Cl. 73-861.350.

Sergeev, Evgeny A.: *See*—
Shibanov, Dmitry A.; Onufriev, Inokenty A.; Khristov, Vladimir A.; and Sergeev, Evgeny A., 4,450,888, Cl. 164-183.000.

Settanni, Richard: *See*—
St. Jean, Herbert N.; and Settanni, Richard, 4,451,734, Cl. 250-342.000.

Setzer, Herbert J.; Bett, John A. S.; and Lesieur, Roger R., to United Technologies Corporation. Iron oxide catalyst for steam reforming. 4,451,578, Cl. 502-303.000.

Seven, Regnell, to Mercado Rehabilitering AB. Seat for a chair for persons having hip and/or leg stiffness. 4,451,086, Cl. 297-312.000.

Seyler, Jay K.: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,451,395, Cl. 260-112.50T.

Shadwick, Jan: *See*—
Odle, Herbert A.; Green, John D.; and Shadwick, Jan, 4,451,875, Cl. 362-297.000.

Shah, Jayantkumar R.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.

Shaklee, Kerry L.: *See*—
Whetstone, Albert L.; and Shaklee, Kerry L., 4,451,698, Cl. 178-19.000.

Shanley, Robert L., II, to RCA Corporation. Picture control for television receiver on-screen display. 4,451,840, Cl. 358-22.000.

Shapiro, Jay B.; and Bank, William. Sign letter structure. 4,450,640, Cl. 40-596.000.

Sharp, John D., to Nalco Chemical Company. Multi-functional hypobromide precursors. 4,451,376, Cl. 210-701.000.

Sharp Kabushiki Kaisha: *See*—
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, 4,451,554, Cl. 430-313.000.
Tanimoto, Akira, 4,450,743, Cl. 84-1.030.

Sharpe, Verlos G.; and Beers, David G., to Magic Chef, Inc. Apparatus for making frozen food products. 4,450,692, Cl. 62-233.000.

Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,451,321, Cl. 156-382.000.

Shaubach, Robert M.; Eastman, George Y.; and Roehm, Vincent P., to Thermacore, Inc. Diaphragm vapor pump. 4,451,210, Cl. 417-52.000.

Shaw, Timothy P.; and Wechter, Abraham J., to Norlin Industries, Inc. Solid body guitar with sealed cavity. 4,450,748, Cl. 84-291.000.

Shell Oil Company: *See*—
Brownscombe, Thomas F.; and Willis, Carl L., 4,451,633, Cl. 526-348.600.
Cagen, Stuart Z., 4,451,482, Cl. 424-284.000.
Horne, Charles A.; Salvo, Stephen A.; Sundelin, Kurt G. R.; and Roman, Steven A., 4,451,466, Cl. 424-251.000.

Shelstad, Richard J. Gantry washing device for tractor-trailer trucks. 4,450,600, Cl. 15-53.00A.

Shepherd, Charles G., to J. A. Wilson Display Ltd. Display panels. 4,450,970, Cl. 211-189.000.

Shepherd, Larry M. Felling wedge. 4,451,024, Cl. 254-104.000.

Shepherd, William L., to Hughes Tool Company. Spaced button thrust surface for earth boring bit. 4,451,162, Cl. 384-95.000.

Sheppard, Patrick J., executor: *See*—
Clabby, Merlyn L., deceased; and Sheppard, Patrick J., executor, 4,450,980, Cl. 221-281.000.

Sherk, Fred T.: *See*—
Edmonds, James T., Jr.; and Sherk, Fred T., 4,451,643, Cl. 528-387.000.

Sherman, James F.: *See*—
Koivunen, Erkki A.; and Sherman, James F., 4,450,735, Cl. 74-781.00R.

Shibanov, Dmitry A.; Onufriev, Inokenty A.; Khristov, Vladimir A.; and Sergeev, Evgeny A., to NPO "Vilitmash". Moulding plant. 4,450,888, Cl. 164-183.000.

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Itaya, Kingo; Shibayama, Kimio; Toshima, Shinobu; Ataka, Tatsuaki; and Iwasa, Koji, 4,451,348, Cl. 204-290.00R.

Shibuta, Osamu; Hasegawa, Tetuo; and Ogawa, Jun, to Otsuka Chemical Co., Ltd. Process for preparing condensed polyalkoxyphosphazene. 4,451,410, Cl. 260-973.000.

Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., to Institut Elektrodinamiki Akademii Nauk Ukrainskoi SSR. Method of detecting symmetrical components of supply-line three-phase voltage and device for carrying out same. 4,451,783, Cl. 324-86.000.

Shigaraki, Ginichi: *See*—
Hanaoka, Tadashi; Umezu, Hiroaki; and Shigaraki, Ginichi, 4,450,659, Cl. 52-167.000.

Shigemasa, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Process control apparatus. 4,451,878, Cl. 364-151.000.

Shiiki, Zenya; and Kawakami, Yukichika, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing aromatic sulfide polymer. 4,451,640, Cl. 528-265.000.

Shikatani, Yutaka: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mituji, 4,451,688, Cl. 585-524.000.

Shimizu, Hiroshi: *See*—
Kobayashi, Setsuo; Beppu, Kazuo; Shimizu, Hiroshi; Ogawa, Satoshi; and Kotani, Ryotaro, 4,451,569, Cl. 435-188.000.

Shimizu, Seiichi, to Canon Kabushiki Kaisha. Interchangeable camera lens assembly. 4,451,131, Cl. 354-286.000.

Shimizu, Shinji: *See*—
Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, 4,451,904, Cl. 365-182.000.

Shimizu, Yasuo: *See*—
Enomoto, Michitoshi; and Shimizu, Yasuo, 4,450,886, Cl. 164-75.000.

Shimoyashiki, Nobuyoshi: *See*—
Akiyama, Hiroyuki; Hatakeyama, Hidewo; Shimoyashiki, Nobuyoshi; Momose, Yoshiaki; and Imai, Fusao, 4,451,417, Cl. 264-53.000.

Shinagawa Shirorenga Kabushiki Kaisha: *See*—
Tsuchida, Yutaka; Mugita, Mikio; Nakano, Yutaka; Sasaki, Naoaki; Ishizawa, Kenki; and Kuroshima, Hiroshi, 4,451,350, Cl. 204-422.000.

Shindaiwa Kogyo Co., Ltd.: *See*—
Morimoto, Hiroyuki, 4,450,627, Cl. 30-391.000.

Shinoda, Akira: *See*—
Takefuta, Hideyasu; and Shinoda, Akira, 4,450,942, Cl. 192-48.900.

Shinoda, Yoshio: *See*—
Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, 4,451,888, Cl. 364-426.000.

Shinoura, Osamu: *See*—
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,451,531, Cl. 428-329.000.

Shipley, Randall S.; and Birkelbach, Donald F., to Dow Chemical Company, The. Process for polymerizing alpha-olefins. 4,451,626, Cl. 526-122.000.

Shiroshita, Masao: *See*—
Sanemitsu, Yuzuru; Shiroshita, Masao; Hashimoto, Shunichi; Katoh, Haruhiko; and Matsumoto, Hiroshi, 4,451,283, Cl. 71-93.000.

Shoji, Fusaji: *See*—
Kataoka, Fumio; Shoji, Fusaji; Obara, Isao; Yokono, Hitoshi; Isogai, Tokio; and Kojima, Mitumasa, 4,451,551, Cl. 430-270.000.

Shu, Winston R.; and Hartman, Kathy J., to Mobil Oil Corporation. Viscous oil recovery method. 4,450,911, Cl. 166-263.000.

Shubb, Richard. Electric pickup device for a musical instrument such as a banjo. 4,450,744, Cl. 84-1.160.

Shultz, Andrew: *See*—
Watanabe, Henry; and Shultz, Andrew, 4,451,393, Cl. 252-536.000.

Shwayder, Warren M. Sweeper drag shoe. 4,450,601, Cl. 15-246.000.

Shwayder, Warren M. Level adjustable skid shoe for plow blades. 4,450,635, Cl. 37-271.000.

Sianesi, Dario; Pasetti, Adolfo; and Belardinelli, Giorgio, to Montedison, S.p.A. High molecular weight polymeric perfluorinated copolyethers and process for their preparation from tetrafluoroethylene. 4,451,646, Cl. 528-401.000.

Sieber, Willi, to Edak AG. Portable protective housing for sensitive apparatus such as electrical and electronic equipment. 4,450,963, Cl. 206-521.000.

Siecor Corporation: *See*—
Bedrosian, Elliot P., 4,451,013, Cl. 242-118.400.
Siemens Aktiengesellschaft: *See*—
Auinger, Herbert, 4,451,751, Cl. 310-184.000.
Franz, Dietmar; and Torggler, Norbert, 4,451,697, Cl. 178-3.000.
Grage, Ludger; and Ryseck, Werner, 4,451,146, Cl. 356-5.000.
Heynisch, Hinrich, 4,451,759, Cl. 313-495.000.
Kopp, Walter; and Saalmueller, Karl-Heinz, 4,451,133, Cl. 355-3.0DD.
Lorenz, Dieter, 4,451,716, Cl. 200-67.00A.
Opitz, Heinrich; Montag, Bernhard; Urban, Gerd; and Turk, Wilfried, 4,450,896, Cl. 165-1.000.
Schonwald, Siegfried, 4,451,211, Cl. 417-271.000.
Sommer, Alfons, 4,450,959, Cl. 206-332.000.
Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, 4,451,336, Cl. 204-47.000.
Siemens Gammasonics, Inc.: *See*—
Engelmohr, Gustav O., 4,450,706, Cl. 72-385.000.
Sigman, Warren R.: *See*—
Stalcup, Robert K.; Sigman, Warren R.; and Prewo, Karl M., 4,451,118, Cl. 350-310.000.
Sijben, Johannes L. H.: *See*—
Bos, Johannes G. G.; Pollaert, Hendricus J. P. M.; and Sijben, Johannes L. H., 4,450,674, Cl. 57-6.000.
Silverman, Jerry E.; Frost, John R.; Hegedus, Elizabeth; and Glicksman, Martin, to General Foods Corporation. High quality, reduced-calorie cake containing cellulose and process thereof. 4,451,490, Cl. 426-553.000.
Silvestrini, Bruno; and Baiocchi, Leandro, to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A. Bendazac treatment of cataract. 4,451,477, Cl. 424-273.00N.
Simard, Julien, to Hydro-Quebec. Ultrasonic position monitor for HV disconnect switch. 4,451,910, Cl. 367-199.000.
Simmering-Graz-Pauker Aktiengesellschaft: *See*—
Raggam, Augustin; and Rabitsch, Hermann, 4,451,331, Cl. 162-18.000.
Simmons Universal Corporation: *See*—
Seeley, Wayne C., 4,451,084, Cl. 297-353.000.
Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, to Newport Pharmaceuticals International, Inc. Imidazole compounds. 4,451,478, Cl. 424-273.00R.
Simonson, Peter: *See*—
Lachenmeier, Kurt; and Simonson, Peter, 4,451,233, Cl. 432-224.000.
Simson, Dionizy; and Walch, Hansjorg, to Sulzer Brothers Ltd. Control device for the nozzles of a jet insertion power loom. 4,450,875, Cl. 139-435.000.
Sinclair, Bernard J.; and Mauro, Dominic R. Batting practice device. 4,451,036, Cl. 273-26.00R.
Singer Company, The: *See*—
Minnich, George E.; and Applegate, Clark L., 4,451,769, Cl. 318-689.000.
Warner, Richard C.; and Laughon, Thomas C., 4,451,865, Cl. 361-23.000.
Singh, Baldev; and Lesher, George Y., to Sterling Drug Inc. Selected 6-alkyl-and 4,6-dialkyl-2(1H)-pyridinones as cardiotonics. 4,451,469, Cl. 424-263.000.
Sinko, Katalin: *See*—
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.
Skala, Karel, to BBC Brown, Boveri & Company, Limited. Device for determining the power output of a turbo-group during disturbances in the electricity supply network. 4,451,740, Cl. 290-40.00C.
SKF Kugellagerfabriken GmbH: *See*—
von Ronai-Horvath, Michael; Schoenung, Bernhard; and Seebo, Kurt, 4,450,677, Cl. 57-81.000.
Winkler, Ottmar; and Pfaller, Egon, 4,451,215, Cl. 418-23.000.
Skidmore, Donald D. Data-terminal service outlet. 4,451,108, Cl. 339-177.00R.
Skopal, Judit: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.
Sliwkowski, Joseph, to Telesis Corporation of Delaware, Inc. Interactive computer aided design system. 4,451,895, Cl. 364-521.000.
Small, Tony M.: *See*—
Clark, James M.; and Small, Tony M., 4,450,907, Cl. 166-223.000.
Smarte Carte, Inc.: *See*—
Mueilner, James M., 4,450,968, Cl. 211-17.000.
Smeggil, John G.; Bornstein, Norman S.; and Brown, Clyde O., to United Technologies Corporation. High temperature coatings by surface melting. 4,451,299, Cl. 148-1.000.
Smisson, Bernard, to Hydro Research and Development (UK) Ltd. Separator. 4,451,366, Cl. 210-209.000.
Smith, Barry L.; and Petit, William A., to General Signal Corporation. Non contact isolated current detector. 4,451,018, Cl. 246-122.00R.
Smith International, Inc.: *See*—
Herd, David P.; and Gibson, Duane E., 4,451,047, Cl. 277-26.000.
Smith Investment Company: *See*—
Melone, Robert R., 4,451,069, Cl. 285-86.000.
Smith, Kenneth C. A., to National Research Development Corporation. Microcircuit fabrication. 4,451,738, Cl. 250-492.200.
Smith and Nephew Associated Companies Ltd.: *See*—
Howes, John G. B., 4,451,624, Cl. 526-292.200.
Smith, Nicholas K.: *See*—
Burke, Edmund T.; Gorman, Patrick H., II; Henderson, James A., Jr.; and Smith, Nicholas K., 4,451,705, Cl. 179-27.00D.
Smith, Robert F., Jr.: *See*—
Neuroth, David H.; and Smith, Robert F., Jr., 4,451,305, Cl. 156-49.000.
Smith, Ryan M.; and Stoller, David A., Sr., to Portec, Inc. Coil car with shiftable trough assemblies. 4,451,188, Cl. 410-42.000.
Smith, Stephen L.: *See*—
Honda, Keith T.; Smith, Stephen L.; and Voyer, Peter E., 4,451,205, Cl. 416-219.00R.
Smithkline-Rit: *See*—
Vandevelde, Jean; and De Neys, Robert, 4,451,446, Cl. 424-92.000.
Smotone, Marvin: *See*—
Greenhaw, Cleo; and Smotone, Marvin, 4,451,168, Cl. 400-623.000.
Snyder Industries, Inc.: *See*—
Snyder, Larry L.; and Florer, Richard, 4,450,976, Cl. 220-343.000.
Snyder, James L.: *See*—
Ryan, Bobby W.; Rye, Rufus A.; and Snyder, James L., 4,450,613, Cl. 29-157.00T.
Snyder, Larry L.; and Florer, Richard, to Snyder Industries, Inc. Wheeled molded container with hinged lid. 4,450,976, Cl. 220-343.000.
Snyder, Steven A., to Coachmen Industries, Inc. Running board construction. 4,451,063, Cl. 280-163.000.
Societe Anonyme de Telecommunications: *See*—
Lefaucheux, Jean-Louis J. R.; Martin, Claude; and Mokrani, Edmond E. A., 4,450,716, Cl. 73-146.500.
Societe Anonyme dite: Compagnie Maritime d'Expertises S.A.: *See*—
Gres, Jean-Pierre; and Icard, Jean-Pierre G., 4,451,723, Cl. 219-98.000.
Societe Chimique des Charbonnages S.A.: *See*—
Decroix, Jean C., 4,451,598, Cl. 524-69.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Philippe, Jean-Jacques; and Lyothier, Robert M., 4,451,206, Cl. 416-228.000.
Verse, Bernard P.; Geoffroy, Alain Y.; and Gentet, Pierre, 4,451,822, Cl. 340-642.000.
Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux - E.F.C.I.S.: *See*—
Dubois, Guy, 4,451,328, Cl. 156-656.000.
Societe Suisee pour l'Industrie Horlogere Management Services, S.A.: *See*—
Lauterburg, Rainer; and Geiger, Hans, 4,451,719, Cl. 200-159.00R.
Sodini, Gregory L., to International Telephone and Telegraph Corporation. Electronic lamp control apparatus. 4,451,763, Cl. 315-159.000.
Soejima, Toshiyuki: *See*—
Kitamura, Minoru; Soejima, Toshiyuki; Hayashi, Tsutomu; Matsui, Hideo; and Fujisawa, Shigenori, 4,451,293, Cl. 75-257.000.
Sofranko, John A.; and Gaffney, Anne M., to Atlantic Richfield Company. Synthesis of oxalate esters by the oxidative carbonylation of alcohols with a heterogeneous manganese promoted Pd-V-P catalyst. 4,451,666, Cl. 560-204.000.
SOLVAY & Cie: *See*—
Branchadell, Jose , 4,451,426, Cl. 264-535.000.
Sommer, Alfons, to Siemens Aktiengesellschaft. Packaging for electrical components. 4,450,959, Cl. 206-332.000.
Sony Corporation: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,451,920, Cl. 371-40.000.
Ichikawa, Iwao; and Kaimori, Kenichiro, 4,451,324, Cl. 156-562.000.
Odaka, Kentaro, 4,451,921, Cl. 371-48.000.
Okada, Takashi; and Tanaka, Yutaka, 4,451,848, Cl. 358-140.000.
Sato, Hiroki; Nakano, Takao; Hatanaka, Masato; Ohhoshi, Toshio; and Tanaka, Sakae, 4,451,756, Cl. 313-422.000.
Yamada, Takaaki, 4,451,794, Cl. 328-134.000.
Yamazaki, Isao, 4,451,899, Cl. 364-900.000.
Sourirajan, Srinivasa: *See*—
Tweddle, Thomas A.; Thayer, William L.; Kutowy, Oleh; and Sourirajan, Srinivasa, 4,451,424, Cl. 264-216.000.
Southern Research Institute: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,451,650, Cl. 544-105.000.
Spelsberg, Hans-Hugo, to Felix Schoeller, Jr., GmbH & Co., KG. Filling for percolating filters for biological waste water purification. 4,451,362, Cl. 210-150.000.
Spence, Derek W. Waste disposal. 4,451,380, Cl. 210-739.000.
Spencer, Donald B. Methods and apparatus for enzymatically producing ethanol. 4,451,566, Cl. 435-162.000.
Spera, Vittorio, to Speral Aluminium Inc. Hand railing assembly. 4,451,025, Cl. 256-65.000.
Speral Aluminium Inc.: *See*—
Spera, Vittorio, 4,451,025, Cl. 256-65.000.
Speranza, George P.; Cuscurida, Michael; and Peterson, Bruce W., to Texaco Inc. High load bearing polyurethane foams made from mixed initiator polyether polyols. 4,451,588, Cl. 521-175.000.
Sperrazza, Joseph; Liu, James C. C.; and Baker, Wilfred E., to United States of America, Army. Method for dispersing or arresting lava flow. 4,451,178, Cl. 405-258.000.
Sperry Corporation: *See*—
Ostergren, William F.; and Ipnar, Albert J., 4,451,004, Cl. 239-658.000.
Stangel, John J.; Herper, John C.; and Rothenberg, Carl, 4,451,831, Cl. 343-374.000.

Sphere Investments Limited: *See*—
Vescovi, Valentino F.; and Richards, Arthur W., 4,451,812, Cl. 336-84.00C.

Spiess, Karl: *See*—
Schaeffler, Georg; Spiess, Karl; Heyne, Jurgen E.; and Krost, Manfred, 4,450,704, Cl. 72-356.000.

Spilgies, Gunter: *See*—
Reinehr, Ulrich; Herbertz, Toni; and Spilgies, Gunter, 4,451,423, Cl. 264-182.000.

Spongr, Jerry J.; and Sawyer, Byron E., to Twin City International, Inc. Apparatus for measuring thickness of coating on continuously moving material. 4,451,732, Cl. 250-308.000.

Spriet, Roger A.: *See*—
Pollet, Robert J.; Vandenberghe, Antoon L.; and Spriet, Roger A., 4,451,555, Cl. 430-445.000.

Sprouse, James H., to Standard Concrete Materials, Inc. Cements, mortars and concretes. 4,451,295, Cl. 106-89.000.

Srinivasan, Rangaswamy: *See*—
Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, 4,451,503, Cl. 427-53.100.

Stadler, Istvan: *See*—
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, 4,451,483, Cl. 424-285.000.

Stahly, G. Patrick, to Ethyl Corporation. Process for producing substituted pyrroles. 4,451,658, Cl. 548-562.000.

Stahnke, Wayne L. Method and apparatus for recording and reproducing pedalling effects in a piano performance. 4,450,749, Cl. 84-462.000.

Stalcup, Robert K.; Sigman, Warren R.; and Prewo, Karl M., to United Technologies Corporation. Composite laser mirror. 4,451,118, Cl. 350-310.000.

Stamicarbon B.V.: *See*—
Janssen, Norbert G. L. M., 4,450,901, Cl. 165-47.000.

Standard Concrete Materials, Inc.: *See*—
Sprouse, James H., 4,451,295, Cl. 106-89.000.

Standard Oil Company, The: *See*—
Bartoszek-Loza, Rosemary, 4,451,343, Cl. 204-158.00R.
Lemanski, Michael F.; and Kliewer, Wayne R., 4,451,579, Cl. 502-306.000.
Pesa, Frederick A.; and Haase, Thomas A., 4,451,407, Cl. 260-465.400.

Standard Oil Company (Indiana): *See*—
Nevitt, Thomas D.; and Jerome, Norman F., 4,451,685, Cl. 585-415.000.

Standlee, Arlie G.: *See*—
Pinnow, Douglas A.; Gentile, Anthony L.; Standlee, Arlie G.; and Timper, Arthur J., 4,451,116, Cl. 350-96.340.

Stangel, John J.; Herper, John C.; and Rothenberg, Carl, to Sperry Corporation. Circular array scanning network. 4,451,831, Cl. 343-374.000.

Stanistreet, Harold P.: *See*—
Bye, Donald J.; Stanistreet, Harold P.; and Lindenstruth, Werner, 4,451,419, Cl. 264-164.000.

Stanley, Philip E.; Woods, William E.; Lemay, Richard A.; and Cushing, David E., to Honeywell Information Systems Inc. Bus sourcing and shifter control of a central processing unit. 4,451,883, Cl. 364-200.000.

Stanley Works, The: *See*—
Bies, Sylvester W.; Fazio, Martin V.; and Matyczyk, George, 4,450,961, Cl. 206-349.000.

Stansbury, Benjamin H., Jr., to Sanchez, Adon. Animal feeding apparatus. 4,450,790, Cl. 119-51.120.

Stape, Frank R. Chimney obstruction detection apparatus. 4,451,120, Cl. 350-319.000.

Starkstrom Gummersbach GmbH: *See*—
Ludwig, Bernd, 4,451,720, Cl. 200-296.000.

Stauffer Chemical Company: *See*—
Teach, Eugene G., 4,451,280, Cl. 71-90.000.

Steibel, James P. Stand for fowl roasting. 4,450,759, Cl. 99-419.000.

Steiner, Hansruedi, to Widmer & Ernst AG. Fire grate for a combustion furnace. 4,450,952, Cl. 198-773.000.

Stenzel, Gerhard: *See*—
Kaule, Wittich; and Stenzel, Gerhard, 4,451,521, Cl. 428-199.000.
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,451,530, Cl. 428-323.000.

Stepan Chemical Company: *See*—
Watanabe, Henry; and Shultz, Andrew, 4,451,393, Cl. 252-536.000.

Stepanian, Michael R.: *See*—
Wang, Jerry C.; and Stepanian, Michael R., 4,451,612, Cl. 525-53.000.

Stephens, David E., to Hollis Engineering, Inc. Soldering apparatus exhaust system. 4,451,000, Cl. 228-20.000.

Sterling Drug Inc.: *See*—
Diana, Guy D., 4,451,476, Cl. 424-272.000.
Singh, Baldev; and Lesher, George Y., 4,451,469, Cl. 424-263.000.

Stevens Engineering, Inc.: *See*—
Coope, Robert L., 4,451,026, Cl. 269-24.000.

Stevens, Richard E.: *See*—
Alioa, Daniel; and Stevens, Richard E., 4,451,053, Cl. 280-47.260.

Stevenson, Robert L. Industrial furnace. 4,450,776, Cl. 110-233.000.

Stewart, Robert L.: *See*—
Kahn, Steven A.; Stewart, Robert L.; and Tolchin, Stephen G., 4,451,827, Cl. 340-825.520.

Stewart, William H.: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.

Steyr-Daimler Puch Aktiengesellschaft: *See*—
Moser, Franz; and Visek, Tomas, 4,450,797, Cl. 123-78.00F.

Stiefel, Peter: *See*—
Engelsmann, Dieter; Lippl, Leo; Nicko, Reinhard; Stiefel, Peter; and Lermann, Peter, 4,451,011, Cl. 242-71.000.

Stites, Francis H., to GTE Products Corporation. Radio frequency transmitter coupling circuit. 4,451,832, Cl. 343-858.000.

Stith, William J.: *See*—
Geissler, Ulrich C.; Grode, Gerald A.; Stith, William J.; and Williams, Ronald A., 4,451,259, Cl. 604-408.000.

Stoller, David A., Sr.: *See*—
Smith, Ryan M.; and Stoller, David A., Sr., 4,451,188, Cl. 410-42.000.

Stolz, Silvano; and Huguenin, Raymond, to Dryan-Fordahl Technologies S.A. High frequency piezoelectric resonator. 4,451,754, Cl. 310-348.000.

Stone, Lyndon R.: *See*—
Callihan, Rudy B.; and Stone, Lyndon R., 4,450,912, Cl. 166-289.000.

Stork, Gilbert: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Barja D.; and Heinsohn, Howard H., Jr., 4,451,392, Cl. 252-522.00R.

Striese, Jim G.; Iafret, John E.; and Batterson, William D., to TRW Inc.; and General Motors Corporation. Adjustable strike. 4,451,071, Cl. 292-341.180.

Strom, Hubert, to Interlake, Inc. Removable step for pallet rack. 4,450,936, Cl. 182-92.000.

Stromberg-Carlson Corporation: *See*—
Brightman, Barrie; Ellis, Thomas E.; Jones, James E.; Lenk, Pedro A.; Shah, Jayantkumar R.; Stewart, William H.; and Woodward, John W., 4,451,702, Cl. 179-18.0ES.
Brightman, Barrie; and Niertit, Frank, 4,451,703, Cl. 179-18.0FA.

Strozza, Peter: *See*—
Pandelena, Michael N.; and Strozza, Peter, 4,451,368, Cl. 210-238.000.

Struve, Alfred; Hill, Frank F.; and Schindler, Joachim, to Henkel KGaA. Transformation of sterols by fermentation. 4,451,564, Cl. 435-55.000.

Stucke, Walter; and Glissmann, Karl-Heinz, to Mannesmann AG. Jacketing steel tubes and pipes. 4,451,413, Cl. 264-26.000.

Stuckey, Clarence W., Jr.; and Meyers, Robert A., deceased (by Meyers, Carol Mae, executrix), to Lockheed Corporation. Circularly polarized antenna formed of a slotted cylindrical dipole. 4,451,829, Cl. 343-705.000.

Stuk, Gregory J.: *See*—
Frisch, Kurt C., Jr.; Lock, Michele R.; and Stuk, Gregory J., 4,451,627, Cl. 526-192.000.

Stull, Robert S.: *See*—
Bricker, Harry C., Jr.; Gutter, David H.; and Stull, Robert S., 4,451,099, Cl. 339-14.00R.

Stuntz, Gordon F., to Exxon Research and Engineering Co. Process for upgrading hydrocarbonaceous oils. 4,451,354, Cl. 208-56.000.

Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, to Ciba-Geigy Corporation. Sulfur-containing oxime compounds, processes for producing them, and their use for protecting cultivated plants. 4,451,279, Cl. 71-93.000.

Sublett, Bobby J.; and Hilbert, Samuel D., to Eastman Kodak Company. Radiation-resistant container material of poly(tetramethylene terephthalate). 4,451,641, Cl. 528-295.500.

Subramanyam, Vinayakam, to New England Nuclear Corporation. Cationic compounds useful for making radiodiagnostic agents. 4,451,450, Cl. 424-1.100.

Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG: *See*—
Hauser, Kurt, 4,451,202, Cl. 416-214.00R.

Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for preparation of granules of low-melting-point metals. 4,450,885, Cl. 164-47.000.

Sugi, Hidekuni: *See*—
Kanayama, Kenji; Sugi, Hidekuni; Kinkori, Shuzo; and Kawasumi, Kouzi, 4,451,749, Cl. 310-62.000.

Sugimoto, Toshihiko: *See*—
Kawazoe, Shiyouzou; Ueda, Zesichi; Sugimoto, Toshihiko; and Moriuchi, Takahiko, 4,451,525, Cl. 428-213.000.

Sugirua, Hiroaki: *See*—
Takada, Takuzo; Sugirua, Hiroaki; and Ilzuka, Takao, 4,450,878, Cl. 141-48.000.

Sugita, Hiroshi; Kawakatsu, Satoshi; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,451,558, Cl. 430-546.000.

Sugita, Hiroshi: *See*—
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,451,559, Cl. 430-552.000.

Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, to Hitachi, Ltd. Semiconductor memory device. 4,451,904, Cl. 365-182.000.

Sugiura, Noboru: *See*—
Nishimura, Yutaka; Ohyama, Yoshishige; and Sugiura, Noboru, 4,450,719, Cl. 73-204.000.

Sugiura, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments having automatic ensemble function based on scale mode. 4,450,742, Cl. 84-1.030.

Sullivan, Barry: *See*—
Dvorak, Bolek, 4,451,322, Cl. 156-461.000.
Sulzer Brothers Limited: *See*—
Niederer, Peter G.; and Frey, Otto, 4,450,592, Cl. 3-1.912.
Simson, Dionizy; and Walch, Hansjorg, 4,450,875, Cl. 139-435.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Method for measuring the flow of a medium. 4,450,715, Cl. 73-118.100.
Sumitomo Chemical Company, Limited: *See*—
Sanemitsu, Yuzuru; Shiroshita, Masao; Hashimoto, Shunichi; Katoh, Haruhiko; and Matsumoto, Hiroshi, 4,451,283, Cl. 71-93.000.
Sumitomo Electric Industries, Ltd.: *See*—
Sakamoto, Katsuji; and Saito, Yasunori, 4,450,676, Cl. 57-6.000.
Sato, Yasutoshi; and Ueno, Keiji, 4,450,871, Cl. 138-140.000.
Sumitomo Metal Industries, Ltd.: *See*—
Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, 4,450,725, Cl. 73-643.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio, 4,450,713, Cl. 73-81.000.
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of an internal combustion engine. 4,450,793, Cl. 123-52.0MB.
Sumner, Mark: *See*—
Parsons, Jack L.; Vizine, Dan; Sumner, Mark; Marathe, Suresh; and Dubicki, Henryk, 4,451,648, Cl. 536-54.000.
Sundelin, Kurt G. R.: *See*—
Horne, Charles A.; Salvo, Stephen A.; Sundelin, Kurt G. R.; and Roman, Steven A., 4,451,466, Cl. 424-251.000.
Sussner, Heinrich: *See*—
Homola, Andrew M.; Lorenz, Max R.; and Sussner, Heinrich, 4,451,495, Cl. 427-27.000.
Suzuki, Fuminori; and Ichikawa, Singo, to Citizen Watch Company Limited. DC-to-DC Voltage converter. 4,451,743, Cl. 307-110.000.
Suzuki, Isao, to Nissan Motor Co., Ltd. Vehicle body. 4,450,926, Cl. 180-312.000.
Suzuki Kogyo Kabushiki Kaisha: *See*—
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,450,803, Cl. 123-308.000.
Suzuki, Kouichi; and Mori, Kazuyuki, to Nissan Motor Company, Limited. Automatic speed control system for an automotive vehicle. 4,451,890, Cl. 364-426.000.
Suzuki, Yoshihisa: *See*—
Kawabata, Susumu; Niimi, Hiroshi; Anahara, Meiji; Suzuki, Yoshihisa; and Omori, Hiroshi, 4,450,678, Cl. 57-333.000.
Suzumura, Nobuyasu: *See*—
Harada, Kuniyoshi; Suzumura, Nobuyasu; and Fujie, Naofumi, 4,451,887, Cl. 364-424.000.
Svensson, Leif A.: *See*—
Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,451,663, Cl. 560-29.000.
Swanson, Paul: *See*—
Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., 4,451,488, Cl. 426-89.000.
Sylven, Hans, to AB Stil-Industri. Device for vehicle safety belts. 4,451,060, Cl. 280-801.000.
Syntex (U.S.A.) Inc.: *See*—
Rogers, Burton L., 4,450,862, Cl. 137-595.000.
Szanati, Jules J. Conveyor lift. 4,450,951, Cl. 198-482.000.
Szantho, Charles F.; and Riordan, Edward D., to Joyal Products, Inc. Fusing machine. 4,451,722, Cl. 219-86.250.
Szekely, Istvan; Kekesi, Krisztina; Lovasz nee Gaspar, Mariann; Botar, Sandor; Hadhazy, Pal; Rakoczi, Istvan; Muszbek, Laszlo; Skopal, Judit; Stadler, Istvan; Horvath, Karoly; Kovacs, Gabor; and Kormoczy, Peter, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 2,3,4-Trinor-m-inter-phenylene-prostaglandin derivatives and compositions and method for inhibiting blood platelet aggregation. 4,451,483, Cl. 424-285.000.
Szekely, Lajos: *See*—
Veisz, Gyorgy; David, Gabor; Koszeghy, Peter; and Szekely, Lajos, 4,451,804, Cl. 333-177.000.
Szporny, Laszlo: *See*—
Nador, Karoly; Kraiss, Gabor; Sinko, Katalin; Paroczai, Margit; Karpati, Egon; and Szporny, Laszlo, 4,451,473, Cl. 424-256.000.
T.A.D. Avanti, Inc.: *See*—
Hanscom, Bradford E., 4,451,707, Cl. 179-84.00R.
T. A. Pelsue Company: *See*—
Beavers, Allan E., 4,450,851, Cl. 135-109.000.
Taguchi, Hiroaki: *See*—
Ogawa, Koji; Taguchi, Hiroaki; Tsutsumi, Takao; Yasuda, Yoshinori; and Takase, Akio, 4,451,043, Cl. 273-186.00R.
Taguchi, Kiyomi; Hanmyo, Masayuki; and Ishikawa, Masaru, to Nippon Kokan Kabushiki Kaisha. Method for horizontal type continuous casting. 4,450,894, Cl. 164-484.000.
Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, to Hitachi, Ltd. Stator of D.C. rotary machine. 4,451,752, Cl. 310-186.000.
Tai, Loui H. T., to Lever Brothers Company. Suds control agents and detergent compositions containing them. 4,451,387, Cl. 252-174.150.
Taira, Kazuo: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.
Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, 4,451,506, Cl. 427-239.000.
Takada, Juichiro. Belt transfer arrangement for a passive vehicle restraint belt system. 4,451,061, Cl. 280-802.000.
Takada, Kazuo; and Umeki, Shinji. Method for manufacturing magnetic recording medium. 4,451,502, Cl. 427-48.000.
Takada, Takuzo; Sugirua, Hiroaki; and Iizuka, Takao, to Yoshino Kogyosho Co., Ltd. Apparatus for filling a high temperature liquid into a biaxially oriented, saturated polyester bottle, a device for cooling said bottle. 4,450,578, Cl. 141-48.000.
Takagi, Kenji: *See*—
Yamashita, Hiromichi; Watari, Yoshiharu; Mutsuro, Hideaki; and Takagi, Kenji, 4,451,175, Cl. 405-50.000.
Takagi, Masao: *See*—
Hirata, Kazuo; and Takagi, Masao, 4,450,927, Cl. 180-330.000.
Takagi, Shigeru: *See*—
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,681, Cl. 60-286.000.
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,682, Cl. 60-286.000.
Takagi, Tadao; and Okabe, Nobuo, to Nippon Kogaku K.K. Automatic focusing device and lens motor control. 4,451,729, Cl. 250-204.000.
Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; Takagi, Toshinori; and Watanabe, Hiroshi, 4,451,499, Cl. 427-38.000.
Takahashi, Akira: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, 4,450,885, Cl. 164-47.000.
Takahashi, Kazushi: *See*—
Miura, Nobuhiro; and Takahashi, Kazushi, 4,450,806, Cl. 123-401.000.
Takahashi, Masaaki: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,451,674, Cl. 568-639.000.
Takahashi, Masanori: *See*—
Kawahara, Fumio; Takahashi, Masanori; and Kumagai, Katsuyoshi, 4,451,609, Cl. 524-708.000.
Takahashi, Noriyoshi: *See*—
Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, 4,451,752, Cl. 310-186.000.
Takahashi, Seiichi: *See*—
Iijima, Tetsuya; and Takahashi, Seiichi, 4,450,897, Cl. 165-2.000.
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Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, 4,451,506, Cl. 427-239.000.
Takahashi, Tomoyuki, to Kabushiki Kaisha Komatsu Seisakusho. Operator's cab in a construction vehicle. 4,451,079, Cl. 296-190.000.
Takai, Kouji: *See*—
Harada, Yutaka; and Takai, Kouji, 4,451,196, Cl. 414-733.000.
Takano, Yoshiya; and Hoshi, Yoshikazu, to Hitachi, Ltd. Distribution type fuel injection pump. 4,450,813, Cl. 123-450.000.
Takase, Akio: *See*—
Ogawa, Koji; Taguchi, Hiroaki; Tsutsumi, Takao; Yasuda, Yoshinori; and Takase, Akio, 4,451,043, Cl. 273-186.00R.
Takase, Ichiro: *See*—
Yasuda, Naohiko; Okutsu, Masaru; Iwagami, Hisao; Nakamiya, Teruaki; and Takase, Ichiro, 4,451,399, Cl. 260-239.100.
Takaya, Katsuhiko: *See*—
Ikegami, Tadashi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,451,573, Cl. 502-113.000.
Takeda Chemical Industries, Ltd.: *See*—
Keshi, Akizo; and Kodama, Katsuhisa, 4,451,587, Cl. 521-171.000.
Takeda, Kenji: *See*—
Ito, Seitoku; Takeda, Kenji; Inagaki, Mitsuo; and Motoda, Nobuo, 4,451,220, Cl. 418-255.000.
Takeda Riken Kogyo Kabushiki Kaisha: *See*—
Ashida, Hitoshi, 4,451,782, Cl. 324-77.00C.
Takefuta, Hideyasu; and Shinoda, Akira, to Diesel Kiki Company, Ltd. Variable speed rotary torque transmission device. 4,450,942, Cl. 192-48.900.
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Electrically operated fuel pump device having a regenerative component. 4,451,213, Cl. 417-366.000.
Takemae, Yoshihiro; Nozaki, Shigeki; Kabashima, Katsuhiko; Enomoto, Seiji; and Mezawa, Tsutomu, to Fujitsu Limited. Address Buffer. 4,451,908, Cl. 365-222.000.
Takenaka, Yuji; and Yoshikawa, Sumio, to Fuji Photo Film Co., Ltd. Method of and apparatus for detecting initial position of easel and lens in photographic apparatus. 4,451,142, Cl. 355-55.000.
Takesako, Yoshinobu: *See*—
Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, 4,451,758, Cl. 313-495.000.
Taketoshi, Kazuhisa; and Ogusu, Chihaya, to Nippon Hoso Kyokai. Method of manufacturing a TV camera tube. 4,451,241, Cl. 445-33.000.
Takeuchi, Yukihisa: *See*—
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,681, Cl. 60-286.000.
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Takimoto, Toshiyuki; and Yaegashi, Takehisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the fuel injection amount of an internal combustion engine. 4,450,816, Cl. 123-492.000.

Talbourdet, John A.: *See*—
Green, Kenneth E.; and Talbourdet, John A., 4,450,693, Cl. 62-514.00R.

Tamamushi, Masahiro, to Nissan Motor Co., Ltd. Anchoring structure for a self-standing seat belt unit. 4,451,087, Cl. 297-468.000.

Tamuro, Yasuharu: *See*—
Hattori, Motonobu; Tamuro, Yasuharu; Ishibashi, Akira; and Nandoh, Kenji, 4,451,112, Cl. 318-778.000.

Tanaka, Hiroyuki: *See*—
Fukuoka, Takashi; Nagao, Yoshiaki; and Tanaka, Hiroyuki, 4,450,933, Cl. 181-229.000.

Tanaka, Kazushi: *See*—
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,451,531, Cl. 428-329.000.

Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, to Toyo Contact Lens Co., Ltd. Contact lens and process for preparing the same. 4,451,629, Cl. 526-238.230.

Tanaka, Masaaki: *See*—
Ando, Ken; Tanaka, Masaaki; and Kawagoe, Michio, 4,450,824, Cl. 123-569.000.

Tanaka, Minoru: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,451,481, Cl. 424-279.000.

Tanaka, Mitsunori, to Seiko Instruments & Electronics Ltd. Electronic watch. 4,451,159, Cl. 368-69.000.

Tanaka, Sakae: *See*—
Sato, Hiroki; Nakano, Takao; Hatanaka, Masato; Ohhoshi, Toshio; and Tanaka, Sakae, 4,451,756, Cl. 313-422.000.

Tanaka, Takeshi: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; and Kawai, Hisasi, 4,450,825, Cl. 123-569.000.

Tanaka, Yutaka: *See*—
Okada, Takashi; and Tanaka, Yutaka, 4,451,848, Cl. 358-140.000.

Tanimoto, Akira, to Sharp Kabushiki Kaisha. Electronic musical instrument with musical information input means. 4,450,743, Cl. 84-1.030.

Tanino, Mikio, to Nissan Motor Company, Limited. Air conditioner for automotive vehicle. 4,450,898, Cl. 165-25.000.

Tanioka, Hiroshi; Ishida, Masato; and Inuzuka, Tsuneki, to Canon Kabushiki Kaisha. Feed control for copying apparatus. 4,451,136, Cl. 355-14.0SH.

Tanner, David P., to Atlantic Richfield Company. High hydrogen amorphous silicon. 4,451,538, Cl. 428-447.000.

Tanner, Nathan S.: *See*—
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,451,926, Cl. 373-93.000.

Tanoff, Michael A.: *See*—
de Mena, Henry F.; and Tanoff, Michael A., 4,451,003, Cl. 236-14.000.

Tarasov, Sergei G.: *See*—
Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.

Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L. Dental prosthesis and method for making same. 4,451,236, Cl. 433-207.000.

Tardy, Maurice, to Bennes Marrel. Hydraulic power slide valve, especially designed for public work equipment. 4,450,865, Cl. 137-625.600.

Tavss, Edward A.; Eigen, Edward; and Clark, Kenneth F., to Colgate-Palmolive Company. Agent for reducing detergent irritation to skin and eyes. 4,451,385, Cl. 252-132.000.

Taylor, John H., to Dectron Inc. Frost detecting device. 4,450,691, Cl. 62-140.000.

Taylor, Michael G. C.; and Buerman, Marc H. L., to GTE Atea NV. Precisely stabilized piezoelectric receiver. 4,451,710, Cl. 179-110.00A.

Teach, Eugene G., to Stauffer Chemical Company. Dithiane and dithiolane herbicide antidotes. 4,451,280, Cl. 71-90.000.

Technigaz: *See*—
Claude, Jean, 4,450,711, Cl. 73-40.50R.

Tecl, Bohuslav; Fahrbach, Erich; Knoke, Jurgen; and Assent, Hans C., to Carl Freudenberg, Firma. Spot bonded pattern for non-woven fabrics. 4,451,520, Cl. 428-198.000.

Tecl, Bohuslav: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,451,314, Cl. 156-148.000.

Teeter, Dennis P.; and Ford, Brian R., to Xerox Corporation. Document storage chamber for coupling asynchronously operated document feeding devices. 4,451,030, Cl. 271-265.000.

Teijin Limited: *See*—
Yamashita, Hiromichi; Watari, Yoshiharu; Mutsuro, Hideaki; and Takagi, Kenji, 4,451,175, Cl. 405-50.000.

Teledyne Industries, Inc.: *See*—
Moore, James C., 4,450,867, Cl. 137-625.440.

Teledyne Republic Manufacturing: *See*—
Acker, Richard C., 4,450,869, Cl. 137-625.480.

Teleskov, Vyacheslav V.: *See*—
Dshkhunian, Valery L.; Ivanov, Eduard E.; Kovalenko, Sergei S.; Mashevich, Pavel R.; Ryzhov, Alexei A.; Teleskov, Vyacheslav V.; and Chicherin, Jury E., 4,451,882, Cl. 364-200.000.

Telesis Corporation of Delaware, Inc.: *See*—
Sliwkowski, Joseph, 4,451,895, Cl. 364-521.000.

Tellier, Pierre: *See*—
Bourson, Lucien; Delavarenne, Serge; and Tellier, Pierre, 4,451,333, Cl. 162-77.000.

Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., to Southern Research Institute. Pyrido[4,3-b][1,4]oxazines and pyrido[4,3-b][1,4]thiazines. 4,451,650, Cl. 544-105.000.

Terachi, Junichi: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; Yamamoto, Kiyomi; Yoshiyasu, Hajimu; and Wada, Yuichi, 4,451,718, Cl. 200-147.00R.

Terada, Shoji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of foamed ceramic article. 4,451,415, Cl. 264-43.000.

Teradyne, Inc.: *See*—
Gillette, Garry C., 4,451,918, Cl. 371-27.000.

Terahara, Akira; and Tanaka, Minoru, to Sankyo Company Limited. M-4 And IsoM-4 derivatives and compositions containing them. 4,451,481, Cl. 424-279.000.

Terry, Malcolm E.: *See*—
D'Augustine, Frank T.; Terry, Malcolm E.; Welsh, Hugh F.; and Payne, Frank A., 4,451,243, Cl. 445-68.000.

Tesch, Rodney C.: *See*—
Donoghue, William J.; and Tesch, Rodney C., 4,451,907, Cl. 365-203.000.

Tesche, Rolf: *See*—
Oppitz, Peter; Schulze-Braucks, Manfred; and Tesche, Rolf, 4,451,263, Cl. 8-500.000.

Teshima, Koichi: *See*—
Matidori, Seika; Teshima, Koichi; and Sakai, Masato, 4,451,430, Cl. 420-492.000.

Teshima, Takanori: *See*—
Akita, Yoshio; Teshima, Takanori; Maruyama, Toshinori; and Torii, Koshi, 4,451,774, Cl. 320-64.000.

Tesik, Jury F.: *See*—
Shidlovsky, Anatoly K.; Taranov, Sergei G.; Braiko, Voldmir V.; Grinberg, Isaak P.; Tesik, Jury F.; and Karasinsky, Oleg L., 4,451,783, Cl. 324-86.000.

Teubner, Helwig; and Oppermann, Wilhelm, to Wolff Walsrode Aktiengesellschaft. Process for the production of hydroxypropyl starch. 4,451,649, Cl. 536-111.000.

Texaco Inc.: *See*—
Allen, Joseph C.; Gillespie, Robert E.; and Burnett, David B., 4,450,913, Cl. 166-303.000.
Knifton, John F.; Lin, Jiang-Jen; Grigsby, Robert A., Jr.; and Brader, Walter H., Jr., 4,451,679, Cl. 568-909.000.
Knifton, John F., 4,451,680, Cl. 568-909.000.
Sanderson, John R.; and Watts, Lewis W., Jr., 4,451,668, Cl. 560-246.000.
Speranza, George P.; Cuscurida, Michael; and Peterson, Bruce W., 4,451,588, Cl. 521-175.000.

Texas Instruments Incorporated: *See*—
Barney, George M.; and Michaelis, Paul R., 4,450,843, Cl. 128-690.000.
Domogalla, John C., 4,451,821, Cl. 340-347.0AD.
Weber, Richard M.; and Bedenbender, John W., 4,450,928, Cl. 181-121.000.

Thayer, David J.; Krause, James J.; and Welk, John R., to Motorola, Inc. Color convergence data processing in a CRT color display station. 4,451,824, Cl. 340-720.000.

Thayer, Paul M., to Water Pollution Control Corp. Ring channel aeration apparatus and method. 4,451,373, Cl. 210-626.000.

Thayer, William L.: *See*—
Tweddle, Thomas A.; Thayer, William L.; Kutowy, Oleh; and Sourirajan, Srinivasa, 4,451,424, Cl. 264-216.000.

Thebault, Claude, to Kis France. Automatic device for the simultaneous printing and development of photographs. 4,451,141, Cl. 355-28.000.

Thedens, Kevin J.; and Roettgen, Leslie A., to Cummins Engine Company, Inc. Water pressure activated override for cylinder deactivator. 4,450,801, Cl. 123-198.00F.

Theodore, John J., to Minnesota Mining and Manufacturing Company. Solvent-based, one-part, filled polyurethane for flexible parts. 4,451,605, Cl. 524-423.000.

Thermacore, Inc.: *See*—
Shaubach, Robert M.; Eastman, George Y.; and Roehm, Vincent P., 4,451,210, Cl. 417-52.000.

Thermoforce Limited: *See*—
Cole, Albert, 4,450,687, Cl. 60-530.000.

Theurer, Josef; and Folser, Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast cleaning machine. 4,450,771, Cl. 104-1.00R.

Thevis, Paul, to Heckler & Koch GmbH. Fire limiter for automatic firearms with hammer blow detonation. 4,450,751, Cl. 89-129.00B.

Tholen, Antonius H. L.: *See*—
Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Tholen, Antonius H. L., 4,451,115, Cl. 350-96.180.

Thoma, Frank; Hoffmann, Karl-Heinz; and Burckhardt, Christoph, to Daimler-Benz Aktiengesellschaft. Hydraulic injection-adjusting device for high pressure injection installations in auto-igniting internal combustion engines. 4,450,818, Cl. 123-502.000.

Thomas Jefferson University: *See*—
Osterholm, Jewell L., 4,450,841, Cl. 128-632.000.
Osterholm, Jewell L., 4,451,251, Cl. 604-24.000.

Thompson, Linda F.: *See*—
Ryston, Ivor; Handley, Harold; Seegmiller, J. Edwin; and Thompson, Linda F., 4,451,570, Cl. 435-240.000.

Thompson, Thomas D., III, to Georgia Kaolin Company, Inc. Utilization of ion exchange resin in the processing of kaolins. 4,451,440, Cl. 423-112.000.

Thomson-CSF: *See*—
Huignard, Jean-Pierre, 4,451,151, Cl. 356-345.000.
Loiseaux, Brigitte; Huignard, Jean P.; Dubois, Jean C.; and Eranian, Armand, 4,451,412, Cl. 264-1.300.

Thum, Waldemar: *See*—
Vetter, Hellmuth; Scheibe, Peter; Thum, Waldemar; and Naher, Gotthilf, 4,451,487, Cl. 435-183.000.

Timko, Joseph M.: *See*—
Van Rheenen, Verlan H.; and Timko, Joseph M., 4,451,404, Cl. 260-397.450.

Timper, Arthur J.: *See*—
Pinnow, Douglas A.; Gentile, Anthony L.; Standlee, Arlie G.; and Timper, Arthur J., 4,451,116, Cl. 350-96.340.

Toennies, Peter: *See*—
Meyer-Kretschmer, Gustav; Jetter, Heinz; and Toennies, Peter, 4,451,437, Cl. 423-3.000.

Toeppen, Thurston. Closure for pressurized containers. 4,450,973, Cl. 215-329.000.

Tokai Electric Wire Company Limited: *See*—
Inoue, Nori, 4,451,109, Cl. 339-258.00S.

Tokico Ltd.: *See*—
Kikuchi, Akira; Sawano, Susumu; and Ito, Yoshimasa, 4,451,195, Cl. 414-732.000.

Tokyo Electric Co., Ltd.: *See*—
Honma, Takao; Matsukura, Nobuaki; Murakami, Keisuke; and Matsuda, Susumu, 4,451,167, Cl. 400-621.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Daigo, Junichi, 4,451,854, Cl. 358-282.000.
Harada, Yutaka; and Takai, Kouji, 4,451,196, Cl. 414-733.000.
Hiraki, Shunichi; Kikuchi, Kiyoshi; Yawata, Shigeo; and Miyagawa, Masafumi, 4,451,302, Cl. 148-187.000.
Hoshimi, Susumu; and Kojima, Tadashi, 4,451,920, Cl. 371-40.000.
Kamemoto, Kazuhiro, 4,451,850, Cl. 358-191.100.
Kawabuchi, Katsuhiro, 4,451,544, Cl. 430-5.000.
Komatsu, Shigeru; and Nakamura, Michio, 4,451,844, Cl. 357-59.000.
Matidori, Seika; Teshima, Koichi; and Sakai, Masato, 4,451,430, Cl. 420-492.000.
Murao, Yutaka, 4,451,897, Cl. 364-900.000.
Saito, Tamio, 4,451,835, Cl. 346-76.0PH.
Shigemasa, Takashi, 4,451,878, Cl. 364-151.000.

Tolchin, Stephen G.: *See*—
Kahn, Steven A.; Stewart, Robert L.; and Tolchin, Stephen G., 4,451,827, Cl. 340-825.520.

Tomita, Masahiro: *See*—
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,681, Cl. 60-286.000.
Sato, Susumu; Takeuchi, Yukihisa; Tomita, Masahiro; Kamiya, Shigeru; and Takagi, Shigeru, 4,450,682, Cl. 60-286.000.

Tomita, Masao: *See*—
Honjo, Masahiro; and Tomita, Masao, 4,451,860, Cl. 360-77.000.

Tomonaga, Atsushi: *See*—
Okuda, Kensuke; Nagai, Hirosi; Fujimaki, Hiroto; Tomonaga, Atsushi; and Aoki, Hideki, 4,451,235, Cl. 433-201.000.

Topol, George J.; and Trent, Chadwick L., to Monitek, Inc. Method for measuring the radiation transmitting properties of a fluid. 4,451,152, Cl. 356-440.000.

Toray Industries, Inc.: *See*—
Ohkubo, Tadahiko; Endo, Tetsuhiko; and Andoh, Akiwo, 4,451,007, Cl. 242-18.00R.

Toreson, James S.: *See*—
Gilovich, Paul A.; and Toreson, James S., 4,451,861, Cl. 360-84.000.

Torggler, Norbert: *See*—
Franz, Dietmar; and Torggler, Norbert, 4,451,697, Cl. 178-3.000.

Torii, Koshi: *See*—
Akita, Yoshio; Teshima, Takanori; Maruyama, Toshinori; and Torii, Koshi, 4,451,774, Cl. 320-64.000.

Torneng, Eyvin: *See*—
Hansen, Helge; Nystrom, Borje; and Torneng, Eyvin, 4,451,460, Cl. 424-238.000.

Torre, Giancarlo D., to Rockwell-Rimoldi S.p.A. Stacked fabric removal and re-locating device. 4,451,191, Cl. 414-118.000.

Tortell, Liliana. Needlework flower stitch. 4,450,782, Cl. 112-266.100.

Toshima, Shinobu: *See*—
Itaya, Kingo; Shibayama, Kimio; Toshima, Shinobu; Ataka, Tatsuaki; and Iwasa, Koji, 4,451,348, Cl. 204-290.00R.

Toy, James W.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Kobayashi, Setsuo; Beppu, Kazuo; Shimizu, Hiroshi; Ogawa, Satoshi; and Kotani, Ryotaro, 4,451,569, Cl. 435-188.000.
Sekino, Masaaki; Fujita, Yoshiyuki; and Ukai, Tetsuo, 4,451,369, Cl. 210-321.100.

Toyo Contact Lens Co., Ltd.: *See*—
Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, 4,451,629, Cl. 526-238.230.

Toyo Seikan Kaisha, Ltd.: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.
Yazaki, Jinichi; Sakano, Korabure; and Matsuo, Junichi, 4,451,512, Cl. 428-36.000.

Toyo Seikan Kaisha Ltd: *See*—
Kobayashi, Seishichi; Mori, Tatsuo; Miyazawa, Tetsuo; Taira, Kazuo; Horiguchi, Makoto; and Takahashi, Susumu, 4,451,506, Cl. 427-239.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Yamakage, Tetsuro, 4,451,185, Cl. 408-2.000.

Toyoshima, Nobuyuki: *See*—
Tanaka, Kyoichi; Kanome, Shinji; Nakajima, Tatsutoshi; Nakada, Kazuhiko; and Toyoshima, Nobuyuki, 4,451,629, Cl. 526-238.230.

Toyota Jidosha Kabushiki Kaisha: *See*—
Ando, Ken; Tanaka, Masaaki; and Kawagoe, Michio, 4,450,824, Cl. 123-569.000.
Kinoshita, Takahiko; Kakeno, Nobuhiko; and Miura, Nobuhiro, 4,450,807, Cl. 123-403.000.
Miura, Nobuhiro; and Takahashi, Kazushi, 4,450,806, Cl. 123-401.000.
Onaka, Hidemi; and Uchitani, Nobuki, 4,450,809, Cl. 123-421.000.
Wada, Hiroki; and Ikuta, Yasuhiro, 4,450,810, Cl. 123-425.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Moriyama, Eiichi; and Kobayashi, Nobuyuki, 4,450,808, Cl. 123-417.000.
Sumiyoshi, Masaharu; and Motosugi, Katsuhiko, 4,450,793, Cl. 123-52.0MB.
Takimoto, Toshiyuki; and Yaegashi, Takehisa, 4,450,816, Cl. 123-492.000.

Traenckner, Hans-Joachim: *See*—
Frank, Walter; Bendazus, Otto; Meixner, Jurgen; Freier, Hans J.; and Traenckner, Hans-Joachim, 4,451,509, Cl. 427-54.100.

Trane Company, The: *See*—
Butt, Alan G., 4,450,903, Cl. 165-110.000.

Transue, James A., to Ethicon, Inc. Surgical clip applier with serpentine spring clip feeder. 4,450,839, Cl. 128-325.000.

Transue, James A.: *See*—
Mericle, Robert W.; and Transue, James A., 4,450,840, Cl. 128-325.000.

Traut, G. Robert, to Rogers Corporation. Radome formed of segmented rings of fiber-PTFE composite. 4,451,833, Cl. 343-872.000.

Treiber, Josef; and Reichmann, Walter, to Metallbau Treiber KG. Method of forming slats for venetian blinds. 4,450,701, Cl. 72-181.000.

Trent, Chadwick L.: *See*—
Topol, George J.; and Trent, Chadwick L., 4,451,152, Cl. 356-440.000.

Treptow, Warren L.: *See*—
Gibbs, Dale S.; and Treptow, Warren L., 4,451,632, Cl. 526-317.000.

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Yasumura, Satoshi, 4,451,796, Cl. 330-127.000.

Triumph-Adler A.G. fur Buround Informationstechnik: *See*—
Frechette, Thomas E.; and Reuter, Helge H., 4,451,166, Cl. 400-208.000.

Troeder, Christoph; Faber, Manfred; and Seigert, Peter, to Jean Walterscheid GmbH. Device for measuring and monitoring the drive of an agricultural implement. 4,450,729, Cl. 73-862.340.

Trop, Moshe; and Livne, Avinoam, to Ben-Gurion University of The Negev Research and Development Authority. Mix for the preparation of bread and cake products. 4,451,491, Cl. 426-555.000.

Trovato, Susan Ann: *See*—
Lasurdo, Mary H., 4,450,636, Cl. 40-152.000.

Trumbull, James L.; and Gillam, William A., to Clayburn Refractories, Inc. Econo bricking ring. 4,450,666, Cl. 52-749.000.

Trumper, Thomas; Rosenberg, Harry; and Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Control systems for mineral mining installations. 4,451,181, Cl. 405-302.000.

TRW Inc.: *See*—
Leiby, John J.; Hodge, Malcolm H.; and Larkin, Joseph F., 4,450,995, Cl. 225-2.000.
Striese, Jim G.; Iafret, John E.; and Batterson, William D., 4,451,071, Cl. 292-341.180.

Tsao, Jung-Hsien; and Hein, Paul R., to W. R. Grace & Co. Polymer composition having terminal alkene and terminal carboxyl groups. 4,451,636, Cl. 528-75.000.

Tsuchida, Hisashi: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takahashi, Akira; Hasegawa, Manshiro; and Tsuchida, Hisashi, 4,450,885, Cl. 164-47.000.

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Tsuchiya, Mitsuharu: *See*—
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Tsugi, Yoshio: *See*—
Yagishita, Aisaburo; Mori, Noboru; Kusumi, Kinshiro; and Tsugi, Yoshio, 4,451,298, Cl. 134-10.000.

Tsukasa Kasei Kogyo Kabushiki Kaisha: *See*—
Matsumoto, Hiroyuki, 4,451,524, Cl. 428-213.000.

Tsutsumi, Takao: *See*—
Ogawa, Koji; Taguchi, Hiroaki; Tsutsumi, Takao; Yasuda, Yoshinori; and Takase, Akio, 4,451,043, Cl. 273-186.00R.
Tuffill, Harold W.: *See*—
Hall, Stephen T.; Hardiman, Raymond; Johnson, Peter W.; Quarendon, Peter; and Tuffill, Harold W., 4,451,825, Cl. 340-750.000.
Tuszini-Nessi Enterprises D'Equipements: *See*—
Meunier, Georges; and Bergougnou, Maurice A., 4,450,895, Cl. 165-1.000.
Tupper, Myron D.; and Bauer, Richard, Jr. Tire splitting apparatus. 4,450,738, Cl. 82-82.000.
Turk, Wilfried: *See*—
Opitz, Heinrich; Montag, Bernhard; Urban, Gerd; and Turk, Wilfried, 4,450,896, Cl. 165-1.000.
Tweddle, Thomas A.; Thayer, William L.; Kutowy, Oleh; and Sourirajan, Srinivasa, to Canadian Patents & Development Limited. Method of gelling cast, polysulfone membranes. 4,451,424, Cl. 264-216.000.
Twin City International, Inc.: *See*—
Spongr, Jerry J.; and Sawyer, Byron E., 4,451,732, Cl. 250-308.000.
Twin Disc, Incorporated: *See*—
Arnold, Bruce C., 4,451,238, Cl. 440-75.000.
Twyman, Noel H., to Automated Production Systems Corporation. Process of producing oil by pyrolysis. 4,451,352, Cl. 208-11.00R.
Tyler, David O.; and Gasparovic, George M., to General Motors Corporation. Reflector for a sealed beam lamp. 4,451,873, Cl. 362-267.000.
Tyler, Derek E.: *See*—
Winter, Joseph; Tyler, Derek E.; and Dantzig, Jonathan A., 4,450,893, Cl. 164-468.000.
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,450,890, Cl. 164-452.000.
Tyndale Plains-Hunter, Ltd.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,451,635, Cl. 528-71.000.
Uchida, Ken: *See*—
Sugiura, June; Kosa, Yasunobu; Komori, Kazuhiro; Uchida, Ken; and Shimizu, Shinji, 4,451,904, Cl. 365-182.000.
Uchida, Shunsuke: *See*—
Nishimura, Eiichi; Uchida, Shunsuke; Kitamura, Masao; Saito, Koichi; Ibe, Eishi; and Hayashi, Tatsuo, 4,451,428, Cl. 376-333.000.
Uchitani, Nobuki: *See*—
Onaka, Hidemi; and Uchitani, Nobuki, 4,450,809, Cl. 123-421.000.
Ueda, Minoru: *See*—
Iyehara, Sadahiro; Masuda, Mitsuya; Inohara, Shizuo; Ueda, Minoru; and Yamamoto, Keisuke, 4,451,846, Cl. 358-56.000.
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Ueda, Zenichi: *See*—
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Uekita, Masakazu: *See*—
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Ueno, Hiroshi: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.
Ueno, Keiji: *See*—
Sato, Yasutoshi; and Ueno, Keiji, 4,450,871, Cl. 138-140.000.
Uetani, Yoshio: *See*—
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,451,542, Cl. 429-174.000.
Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Polyamide as a primer for use with asphaltic membranes. 4,451,171, Cl. 404-31.000.
Uhl, Leopold: *See*—
Ernst, Helmut; Gehrhardt, Karl-Heinz; Uhl, Leopold; and Wolert, Hartmut, 4,451,232, Cl. 432-103.000.
Ukai, Tetsuo: *See*—
Sekino, Masaaki; Fujita, Yoshiyuki; and Ukai, Tetsuo, 4,451,369, Cl. 210-321.100.
Ulry, Donald C.; Cosner, Charles G.; and Ryan, Thomas D., to Formulabs Industrial Inks, Inc. Surface coloring of polyvinyl resins. 4,451,264, Cl. 8-508.000.
Umeki, Shinji: *See*—
Takada, Kazuo; and Umeki, Shinji, 4,451,502, Cl. 427-48.000.
Umetsu, Hiroshi: *See*—
Yamashita, Katsuji; Umetsu, Hiroshi; Sato, Hirotaka; Matsuoka, Yoshio; and Kida, Kei, 4,451,433, Cl. 422-63.000.
Umezawa, Michio, to Ricoh Company, Ltd. Paper loading apparatus. 4,451,169, Cl. 400-631.000.
Umezu, Hiroaki: *See*—
Hanaoka, Tadashi; Umezu, Hiroaki; and Shigaraki, Ginichi, 4,450,659, Cl. 52-167.000.
Ungarean, Gary L.: *See*—
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,450,890, Cl. 164-452.000.
Union Carbide Corporation: *See*—
Acoreh, Byron H., 4,450,858, Cl. 137-505.370.
Andreini, Rockne J., 4,451,288, Cl. 75-60.000.
Brown, Harry J., 4,451,508, Cl. 427-423.000.
Drake, Kenneth; and Hammock, Richard A., 4,451,608, Cl. 524-560.000.
Kamp, Ewald A., 4,450,996, Cl. 225-43.000.
Kennedy, Robert J., Sr.; Kennedy, Robert J., Jr.; and Ramachandran, Sundaresan, 4,451,537, Cl. 428-391.000.
Nicholakopoulos, Antonios; Gill, Grace M.; and Nadin, Robert P., 4,451,593, Cl. 523-322.000.
Uniroyal, Inc.: *See*—
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., 4,451,575, Cl. 502-122.000.
United Kingdom Atomic Energy Authority: *See*—
Butler, Graham; and Wright, Christopher J., 4,451,580, Cl. 502-335.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Johncock, Peter, 4,451,645, Cl. 528-391.000.
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Administrator, National Aeronautics and Space Administration: *See*—
Marshall, William R., 4,451,017, Cl. 244-172.000.
Agriculture: *See*—
Schwab, Arthur W., 4,451,265, Cl. 44-51.000.
Schwab, Arthur W.; and Pryde, Everett H., 4,451,267, Cl. 44-53.000.
Army: *See*—
Kirkendall, Richard D.; Drysdale, William H.; and Kokinakis, Louis D., 4,450,770, Cl. 102-523.000.
Rozniecki, Edward J.; and Wittbrodt, Donald R., 4,451,785, Cl. 324-158.00R.
Sperrazza, Joseph; Liu, James C. C.; and Baker, Wilfred E., 4,451,178, Cl. 405-258.000.
Vig, John R.; and Filler, Raymond L., 4,451,755, Cl. 310-361.000.
Energy: *See*—
Fasching, George E., 4,451,826, Cl. 340-825.070.
Health and Human Services: *See*—
Parsons, Jack L.; Vizine, Dan; Sumner, Mark; Marathe, Suresh; and Dubicki, Henryk, 4,451,648, Cl. 536-54.000.
National Aeronautics and Space Administration: *See*—
Gedwill, Michael A.; Levine, Stanley R.; and Glasgow, Thomas K., 4,451,496, Cl. 427-34.000.
Navy: *See*—
Atkins, Ronald L.; Hollins, Richard A.; Norris, William P.; Nielsen, Arnold T.; and Wilson, William S., 4,451,681, Cl. 568-932.000.
Young, Virgel J.; and Myers, Harry S., Jr., 4,451,847, Cl. 358-99.000.
Puerto Rico: *See*—
Connelly, Kathleen G., 4,450,633, Cl. 36-101.000.
U.S. Philips Corporation: *See*—
Classens, Adrianus M. M.; Aalbertsberg, Frederik W.; and Van Marle, Hendrika G., 4,451,692, Cl. 174-23.00C.
Jans, Johannes M., 4,451,505, Cl. 427-98.000.
Kilian, Ernst A., 4,451,795, Cl. 330-107.000.
Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Tholen, Antonius H. L., 4,451,115, Cl. 350-96.180.
Prodinger, Arnold, 4,451,864, Cl. 360-130.330.
Rijckaert, Albert M. A.; Ruyten, Henricus M.; Hoefnagels, Johannes F.; and Schoenmakers, Johannes J. M., 4,451,862, Cl. 360-109.000.
United States Steel Corporation: *See*—
Salmi, Robert W., 4,451,360, Cl. 209-230.000.
United Technologies Corporation: *See*—
Grot, Arnold S., 4,450,889, Cl. 164-361.000.
Honda, Keith T.; Smith, Stephen L.; and Voyer, Peter E., 4,451,205, Cl. 416-219.00R.
Setzer, Herbert J.; Bett, John A. S.; and Lesieur, Roger R., 4,451,578, Cl. 502-303.000.
Smeggil, John G.; Bornstein, Norman S.; and Brown, Clyde O., 4,451,299, Cl. 148-1.000.
Stalcup, Robert K.; Sigman, Warren R.; and Prewo, Karl M., 4,451,118, Cl. 350-310.000.
Universite Laval: *See*—
Pomerleau, Andre; and Brousseau, Jean-Francoys, 4,451,896, Cl. 364-569.000.
University of California, The Regents of the: *See*—
Ryston, Ivor; Handley, Harold; Seegmiller, J. Edwin; and Thompson, Linda F., 4,451,570, Cl. 435-240.000.
University Patents, Inc.: *See*—
Allen, Robert H., 4,451,571, Cl. 436-505.000.
Goepp, Robert A.; Freese, Uwe E.; and Loeb, Marvin P., 4,450,836, Cl. 128-127.000.
Uozumi, Shoji: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,451,317, Cl. 156-307.300.
Upjohn Company, The: *See*—
Van Rheenen, Verlan H.; and Timko, Joseph M., 4,451,404, Cl. 260-397.450.
Uranerzbergbau-GmbH: *See*—
Floeter, Wilfried; Schoening, Gerhard; and Schroeer, Klaus, 4,451,438, Cl. 423-20.000.
URANIT Uran-Isotopentrennungs-GmbH: *See*—
Meyer-Kretschmer, Gustav; Jetter, Heinz; and Toennies, Peter, 4,451,437, Cl. 423-3.000.
Urayama, Kiyoshi, to Kabushiki Kaisha Hosakawa Funtai Kogaku Kenkyosho. Gas flow type crushing and classifying apparatus. 4,451,005, Cl. 241-40.000.

Urban, Gerd: *See*—
Opitz, Heinrich; Montag, Bernhard; Urban, Gerd; and Turk, Wilfried, 4,450,896, Cl. 165-1.000.

Urban Systems Streetscape, Inc.: *See*—
Winden, Joseph, 4,450,974, Cl. 220-1.00T.

USM Corporation: *See*—
Farley, Wilbur H.; Kotek, Alfred J.; and Carlson, John H., 4,451,098, Cl. 308-201.000.
Schaty, Harald, 4,450,605, Cl. 24-457.000.
Wickers, Francis A.; and Dorosz, Adolph S., 4,450,781, Cl. 112-262.100.
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,450,619, Cl. 29-564.100.

Vaidya, Sheila: *See*—
Fuls, Ellis N.; Lifshitz, Nadia; and Vaidya, Sheila, 4,450,620, Cl. 29-571.000.

VALEO: *See*—
Caray, Andre , 4,450,945, Cl. 192-89.00B.
Herbulot, Jean, 4,450,940, Cl. 188-71.300.

Vallee, Antoine; and Goguelin, Michel, to Arjomari-Prioux. Surfacing foils for coating plastics parts. 4,451,539, Cl. 428-515.000.

Vandenberghe, Antoon L.: *See*—
Pollet, Robert J.; Vandenberghe, Antoon L.; and Spriet, Roger A., 4,451,555, Cl. 430-445.000.

Vandevelde, Jean; and De Neys, Robert, to Smithkline-Rit. Process for the preparation of polysaccharide-protein complexes from bacterial capsules, obtained products and immunogenic compositions containing them. 4,451,446, Cl. 424-92.000.

VanDuren, Richard G.: *See*—
Heath, Chester A.; and VanDuren, Richard G., 4,451,884, Cl. 364-200.000.

Van Dyke, Martin J.: *See*—
Dougherty, William R.; Colby, Dwight D.; Fahley, Jerome A.; and Van Dyke, Martin J., 4,451,894, Cl. 364-509.000.

Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, to Siemens Aktiengesellschaft. Additive-free, fast precipitating palladium electrolyte bath and process. 4,451,336, Cl. 204-47.000.

Van Hecke, Michel C.; and Fontainas, Luc M., to Metallurgie Hoboken-Overpelt. Process for extracting non-ferrous metals from iron-bearing scraps. 4,451,289, Cl. 75-63.000.

Vanhumbeeck, Jacky: *See*—
Vangaever, Frank; Vanhumbeeck, Jacky; Danneels, Laurent; Boone, Luc; and Demaegd, Luc, 4,451,336, Cl. 204-47.000.

Van Marle, Hendrika G.: *See*—
Classens, Adrianus M. M.; Aalbertsberg, Frederik W.; and Van Marle, Hendrika G., 4,451,692, Cl. 174-23.00C.

van Mullekom, Hubert P., to Ruti-te Strake B.V. Method for weaving on a weaving machine operating with a blowing nozzle for a flowing transport fluid. 4,450,876, Cl. 139-435.000.

Vannucci, Pasquale: *See*—
Ruggeri, Antonio, 4,451,367, Cl. 210-207.000.

van Olst, Gijsbrecht H. J., to Nederlandse Kuntstofindustrie Soesterberg. Plastic ski slide. 4,451,032, Cl. 272-56.5SS.

Van Rheenen, Verlan H.; and Timko, Joseph M., to Upjohn Company, The. 16β-Methyl steroid process. 4,451,404, Cl. 260-397.450.

Van Sickle, James R., to CPG Products Corp. Tender-mounted sound system for toy steam locomotive. 4,450,772, Cl. 104-295.000.

Van Steenkiste, Roger C. Apparatus for branding milk cartons. 4,450,765, Cl. 101-11.000.

Vapor Corporation: *See*—
Alexander, William H.; and Burger, Joe R., 4,450,854, Cl. 137-246.120.

Vas-Cath of Canada Limited: *See*—
Martin, Geoffrey S., 4,451,252, Cl. 604-43.000.

VCD Fuel Systems: *See*—
Venning, Scott; and Discount, Dennis, 4,450,821, Cl. 123-525.000.

VDO Adolf Schindling AG: *See*—
Sauerschell, Wolfgang; Wietschorke, Stephan; and Ruschek, Gerhard, 4,450,804, Cl. 123-366.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Forster, Karl-Heinz; Johne, Hans; Schuck, Helmut; and Friedrich, Ludwig, 4,450,767, Cl. 101-365.000.

Veisz, Gyorgy; David, Gabor; Koszeghy, Peter; and Szekely, Lajos. Four-terminal network. 4,451,804, Cl. 333-177.000.

Venning, Scott; and Discount, Dennis, to VCD Fuel Systems. Gaseous fuel delivery system. 4,450,821, Cl. 123-525.000.

Venning, Scott J. Gaseous fuel delivery system. 4,450,822, Cl. 123-525.000.

Verdol S.A.: *See*—
Decuq, Guy; and Mouterde, Anne, 4,451,006, Cl. 242-18.0DD.

Verne, Stefan, to BICC Public Limited Company. Manufacture of coextruded oriented products. 4,451,306, Cl. 156-51.000.

Verse, Bernard P.; Geoffroy, Alain Y.; and Gentet, Pierre, to Societe Nationale industrielle Aerospatiale. Device for automatically checking a plurality of electric indicator lights. 4,451,822, Cl. 340-642.000.

Vertesy, Laszlo; Mracek, Miroslav; Braunitzer, Gerhard; and Aschauer, Heinz, to Hoechst Aktiengesellschaft. α-Amylase inactivator, a process for its preparation, an agent based on this inactivator and its use. 4,451,455, Cl. 424-177.000.

Vertimag Systems Corporation: *See*—
Johnson, Clark E., Jr., 4,451,858, Cl. 360-32.000.

Vescovi, Valentino F.; and Richards, Arthur W., to Sphere Investments Limited. Electrostatic shield. 4,451,812, Cl. 336-84.00C.

Vest, Gary W. Combined ballast container and wall plug for portable electrical equipment. 4,451,693, Cl. 174-52.00R.

Vetter, Hellmuth; Scheibe, Peter; Thum, Waldemar; and Naher, Gotthilf, to Boehringer Mannheim GmbH. Process for the purification or enrichment of biologically active proteins. 4,451,487, Cl. 435-183.000.

Veveris, Maris M.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

Veyrassat, Louis; and Meisser, Marc, to Maillefer S.A. Double wire-winding machine with automatic transfer. 4,451,008, Cl. 242-25.00A.

Vick, Ralph L., to Bendix Corporation, The. Liquid spring accumulator with self-charging means. 4,450,870, Cl. 138-31.000.

Victorius, Claus, to Du Pont de Nemours, E. I., and Company. High solids color coat containing alcohol soluble cellulose acetate butyrate. 4,451,597, Cl. 524-39.000.

Vidal-Meza, Gonzalo D., to Caterpillar Tractor Co. Heat exchanger plate having distortion resistant uniform pleats. 4,450,705, Cl. 72-379.000.

Viertel, Lothar; and Kaiser, Peter, to Gebr. Happich GmbH. Outer support bracket for automobile sun visors. 4,451,076, Cl. 296-97.00K.

Vig, John R.; and Filler, Raymond L., to United States of America, Army. Acceleration sensitivity reduction method. 4,451,755, Cl. 310-361.000.

Vijayakumar, Kalambella M.: *See*—
Lichtin, Norman N.; and Vijayakumar, Kalambella M., 4,451,342, Cl. 204-157.10R.

Villavicencio, Enrique, Jr.; and Villavicencio, Enrique, Sr. Survival kit. 4,450,966, Cl. 296-547.000.

Villavicencio, Enrique, Sr.: *See*—
Villavicencio, Enrique, Jr.; and Villavicencio, Enrique, Sr., 4,450,966, Cl. 206-547.000.

Villeroy & Boch Keramische Werke KG: *See*—
Zimmer, Kurt, 4,451,307, Cl. 156-63.000.

Vilter Manufacturing Corporation: *See*—
Kocher, Erich J., 4,450,856, Cl. 137-315.000.

Vines, Harvey L.; and Marano, Vincent. Nitrogen rejection from natural gas with CO_2 and variable N_2 content. 4,451,275, Cl. 62-28.000.

Vinogradov, Alexei V.: *See*—
Kalvinsh, Ivars Y.; Vinogradov, Alexei V.; Veveris, Maris M.; Makarova, Inna I.; Birman, Anatoly S.; Barmotin, Georgy V.; and Akifiev, Oleg N., 4,451,485, Cl. 424-316.000.

Vinyl Improvement Products Company: *See*—
Katz, Harry, 4,450,665, Cl. 52-522.000.

Visek, Tomas: *See*—
Moser, Franz; and Visek, Tomas, 4,450,797, Cl. 123-78.00F.

Visner, Sidney: *See*—
Ross, Malcolm F.; and Visner, Sidney, 4,451,427, Cl. 376-267.000.

Vitner, Joseph, to Kalama Chemical, Inc. Process for the recovery of alkali metal salts from squeous solutions thereof. 4,451,330, Cl. 159-48.200.

Vizine, Dan: *See*—
Parsons, Jack L.; Vizine, Dan; Sumner, Mark; Marathe, Suresh; and Dubicki, Henryk, 4,451,648, Cl. 536-54.000.

Vogel, Roger F.: *See*—
Mitchell, Bruce R.; and Vogel, Roger F., 4,451,355, Cl. 208-113.000.

Volkmer, Richard B.: *See*—
Boettcher, William C.; Volkmer, Richard B.; and Wehde, Wayne R., 4,450,987, Cl. 222-641.000.

Volz, Herbert A., to Phillips Petroleum Company. Heat exchanger having means for supporting the tubes in spaced mutually parallel relation and suppressing vibration. 4,450,904, Cl. 165-162.000.

von Ronai-Horvath, Michael; Schoenung, Bernhard; and Seebo, Kurt, to SKF Kugellagerfabriken GmbH. Thread monitor and a slubbing clamping device for draw frames of spinning machines equipped with double upper rollers. 4,450,677, Cl. 57-81.000.

Vossen, John L., Jr.: *See*—
Weakliem, Herbert A.; and Vossen, John L., Jr., 4,450,787, Cl. 118-723.000.

Voyer, Peter E.: *See*—
Honda, Keith T.; Smith, Stephen L.; and Voyer, Peter E., 4,451,205, Cl. 416-219.00R.

W. Haking Enterprises Limited: *See*—
Yan, Chan K., 4,451,130, Cl. 354-82.000.

W. R. Grace & Co.: *See*—
Ernest, Michael V.; and Maselli, James M., 4,451,441, Cl. 423-213.200.
Tsao, Jung-Hsien; and Hein, Paul R., 4,451,636, Cl. 528-75.000.

Wada, Chuzoh; Matsuda, Yoshikazu; and Asano, Yoshio, to Matsushita Electric Industrial Co., Ltd. Burner. 4,451,228, Cl. 431-76.000.

Wada, Hiroki; and Ikuta, Yasuhiro, to Toyota Jidosha Kabushiki Kaisha. Device for controlling spark timing and fuel injection of an internal combustion engine. 4,450,810, Cl. 123-425.000.

Wada, Ryoichi; Tsuchiya, Mitsuharu; Senoo, Takanori; and Odagi, Kanji, to Matsushita Electric Industrial Co., Ltd. Digital signal processor for use in recording and/or reproducing equipment. 4,451,919, Cl. 371-38.000.

Wada, Tomio: *See*—
Kishi, Kohhei; Kato, Hiroaki; Matsuura, Masataka; and Wada, Tomio, 4,451,554, Cl. 430-313.000.

Wada, Yuichi: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; Yamamoto, Kiyomi; Yoshiyasu, Hajimu; and Wada, Yuichi, 4,451,718, Cl. 200-147.00R.

Waddell, Thomas P. Body weight support system. 4,450,832, Cl. 128-80.00G.

Wagner, Ludwig: *See*—
Knabel, Walter; Wagner, Ludwig; and Jungkind, Roland, 4,451,059, Cl. 280-632.000.

Waitkus, Phillip A.: *See*—
D'Alelio, Gaetano F.; and Waitkus, Phillip A., 4,451,669, Cl. 562-442.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,451,402, Cl. 548-461.000.

Wakabayashi, Hiroshi: *See*—
Yonezawa, Kazuya; Kira, Kazuaki; Wakabayashi, Hiroshi; and Nagano, Hirosaku, 4,451,621, Cl. 525-426.000.

Wakino, Kikuo: *See*—
Ogawa, Toshio; and Wakino, Kikuo, 4,451,753, Cl. 310-315.000.

Wakui, Natsuko: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,451,678, Cl. 568-902.000.

Walch, Hansjorg: *See*—
Simson, Dionizy; and Walch, Hansjorg, 4,450,875, Cl. 139-435.000.

Walker, Loren H.: *See*—
Boettner, Fred H.; Cutler, John H.; and Walker, Loren H., 4,451,770, Cl. 318-757.000.

Walker, Stephen E.; Bedford, Keith; and Eaves, Terence, to Hoechst Aktiengesellschaft. Pharmaceutical preparations in solid unit dosage form. 4,450,877, Cl. 141-1.000.

Walsh, Robert J., to Monsanto Company. Temperature control for wafer polishing. 4,450,652, Cl. 51-131.400.

Wang, Jerry C.; and Stepanian, Michael R., to Mobil Oil Corporation. Continuous process for the preparation of rubber modified polymers. 4,451,612, Cl. 525-53.000.

Wardley, George, to Marldon (Engineering Specialties) Limited. Traversing unit with balanced load applying means. 4,450,731, Cl. 74-25.000.

Warner, Richard C.; and Laughon, Thomas C., to Singer Company, The. Electrical cutout for under voltage or power loss conditions. 4,451,865, Cl. 361-23.000.

Warnock, Denny F. Apparatus for blending and dispensing a mixture of asphalt emulsion and sand. 4,451,153, Cl. 366-13.000.

Waschka, George A., Jr.: *See*—
Casper, Paul W.; Seiler, Norman C.; Nixon, Thomas J.; Waschka, George A., Jr.; Patisaul, Charles R.; Toy, James W.; Burton, Willie T., Jr.; Ashley, W. B.; Orlando, Fred J., Jr.; Giri, Ronald R.; Halpern, Peter H.; Jones, J. Richard; and Iley, Harold, 4,451,916, Cl. 370-16.000.

Watanabe, Henry; and Shultz, Andrew, to Stepan Chemical Company. Cleaner for ovens and the like using sodium alpha olefin sulfonate, sodium hydroxide, and sodium silicate. 4,451,393, Cl. 252-536.000.

Watanabe, Hiroshi: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,451,893, Cl. 364-494.000.
Morimoto, Kiyoshi; Takagi, Toshinori; and Watanabe, Hiroshi, 4,451,499, Cl. 427-38.000.

Watanabe, Kazuhide: *See*—
Abe, Seiko; Igashira, Toshihiko; and Watanabe, Kazuhide, 4,450,823, Cl. 123-549.000.

Watanabe, Kazuhiro: *See*—
Fujimaki, Hiroto; Ajima, Shigetoshi; and Watanabe, Kazuhiro, 4,451,590, Cl. 523-155.000.

Watanabe, Kiyohiko: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,451,213, Cl. 417-366.000.

Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Picture image display device including a row of parallel control electrodes. 4,451,758, Cl. 313-495.000.

Watanabe, Michio: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.

Watanabe, Toshiyasu: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,451,678, Cl. 568-902.000.

Watari, Yoshiharu: *See*—
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Water Pollution Control Corp.: *See*—
Thayer, Paul M., 4,451,373, Cl. 210-626.000.

Watkins, Norman C. Insulative roof structure. 4,450,663, Cl. 52-309.400.

Watson, Eric; and Hunter, Eric, to British Nuclear Fuels Limited. Storage pond. 4,451,173, Cl. 405-53.000.

Watts, Lewis W., Jr.: *See*—
Sanderson, John R.; and Watts, Lewis W., Jr., 4,451,668, Cl. 560-246.000.

Wavin B.V.: *See*—
LeLoux, Arnoldus W. J., 4,451,308, Cl. 156-64.000.

Waxman, Ronald, to Beltone Electronics Corporation. Eye glass hearing aids. 4,451,709, Cl. 179-107.00S.

Waymire, John W.: *See*—
Penn, Paul E.; and Waymire, John W., 4,451,823, Cl. 340-648.000.

Weakliem, Herbert A.; and Vousen, John L., Jr., to RCA Corporation. Glow discharge plasma deposition of thin films. 4,450,787, Cl. 118-723.000.

Weaver, Joe C.: *See*—
Kirkley, J. Darrell; and Weaver, Joe C., 4,451,871, Cl. 362-186.000.

Weaver, Johnny L. Drafting and drawing table. 4,450,774, Cl. 108-23.000.

Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., to A. R. Wilfley and Sons, Inc. Mixing device. 4,451,155, Cl. 366-265.000.

Weber, Richard M.; and Bedenbender, John W., to Texas Instruments Incorporated. Dual mode seismic source vibrator. 4,450,928, Cl. 181-121.000.

Webinger, George P., to Champion International Corporation. Wrap around sleeve for tapered tub. 4,451,001, Cl. 229-40.000.

Wechter, Abraham J.: *See*—
Shaw, Timothy P.; and Wechter, Abraham J., 4,450,748, Cl. 84-291.000.

Weeks, Paul D.; and Allingham, Robert P., to Pfizer Inc. Preparation of gamma-pyrone intermediates. 4,451,661, Cl. 549-417.000.

Wegemund, Bernd: *See*—
Wilk, Hans-Christoph; and Wegemund, Bernd, 4,451,596, Cl. 523-501.000.

Wehde, Wayne R.: *See*—
Boettcher, William C.; Volkmer, Richard B.; and Wehde, Wayne R., 4,450,987, Cl. 222-641.000.

Weikert, Norbert B.: *See*—
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Weikl, Andreas; and Hubmann, Max, to Intermedicat GmbH. Catheter set. 4,451,256, Cl. 604-164.000.

Weiland, Werner, to Rheintechnik, Weiland & Kasper KG. Device for arresting the hind leg of an animal. 4,450,792, Cl. 119-126.000.

Weinkauff, David J.: *See*—
Baker, Joseph W.; Mansfield, Dennis L.; and Weinkauff, David J., 4,451,486, Cl. 424-317.000.

Weirich, Walter: *See*—
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Welch, Norman D.; and Woestman, John W., to RCA Corporation. Circuit for providing a common setpoint for manual and automatic regulation of a process control system. 4,451,879, Cl. 364-181.000.

Welding Engineers, Inc.: *See*—
Rossiter, Paul H., 4,451,414, Cl. 264-40.500.

Welk, John R.: *See*—
Thayer, David J.; Krause, James J.; and Welk, John R., 4,451,824, Cl. 340-720.000.

Welle, Hendricus B. A.: *See*—
Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., 4,451,452, Cl. 424-78.000.

Welsh, Hugh F.: *See*—
D'Augustine, Frank T.; Terry, Malcolm E.; Welsh, Hugh F.; and Payne, Frank A., 4,451,243, Cl. 445-68.000.

Welzel, Dieter: *See*—
Buhlmann, Hans; and Welzel, Dieter, 4,451,458, Cl. 424-183.000.

Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, to Ciba-Geigy Corporation. Method of treating inflammation and pain using heteramino benzofurans. 4,451,462, Cl. 424-248.550.

Werkzeugmaschinenfabrik Oerlikon Buhrle AG: *See*—
Moser, Franz, 4,450,769, Cl. 102-444.000.

Werstak, Charles E.: *See*—
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Larson, Duane B.; and Westermeier, Richard J., 4,450,702, Cl. 72-250.000.

Westfalia Separator AG: *See*—
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Westinghouse Electric Corp.: *See*—
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Gyugyi, Laszlo, 4,451,777, Cl. 323-210.000.
Liu, Chi-Sheng; and Hirayama, Chikara, 4,451,924, Cl. 372-59.000.

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Westvaco Corporation: *See*—
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Wetmore, Sherman B., to Global Marine Inc. Monopod jackup drilling system. 4,451,174, Cl. 405-196.000.

Wetterlin, Kjell I. L.: *See*—
Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,451,663, Cl. 560-29.000.

WFI International, Inc.: *See*—
Ryan, Bobby W.; Rye, Rufus A.; and Snyder, James L., 4,450,613, Cl. 29-157.00T.

Wheaton Industries: *See*—
Batchelor, Gary R.; Russo, Carmen A., Sr.; and Bradley, Martin, 4,451,329, Cl. 156-660.000.

Wheeler, Glynn P.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,451,650, Cl. 544-105.000.

Whetstone, Albert L.; and Shaklee, Kerry L., to Display Interface Corporation. Coordinate digitizing device. 4,451,698, Cl. 178-19.000.

Whipple, Sharon S.: *See*—
Jeffrey, Gaines C.; Cooper, Lance A.; and Whipple, Sharon S., 4,451,442, Cl. 423-224.000.

White, Alan C.; and Wyllie, Michael G., to John Wyeth & Brother Ltd. Anti-obesity agents. 4,451,465, Cl. 424-251.000.

White Farm Equipment Company: *See*—
Deckler, Harry C., 4,450,979, Cl. 221-263.000.
White, Harvey C. Rotary fluid pressure device. 4,451,217, Cl. 418-69.000.
White, May S., co-executrix: *See*—
Papathomas, Thomas V.; Scuderi, Rudolph, deceased; White, May S., co-executrix; and D'Ambrose, Camille, co-executrix, 4,451,773, Cl. 320-59.000.
White, Robert N.: *See*—
Uffner, William E.; and White, Robert N., 4,451,171, Cl. 404-31.000.
Whitehouse, Harry T.: *See*—
Duval, Eugene F.; Bagshaw, David P.; Kast, Michael A.; Masters, Gilbert M.; and Whitehouse, Harry T., 4,450,868, Cl. 137-625.290.
Whitener, Philip C., to Boeing Company, The. Composite structures window belt and method of making. 4,450,661, Cl. 52-206.000.
Wibbelt, Friedrich: *See*—
Ostkamp, Willi; Brunner, Karlheinz; and Wibbelt, Friedrich, 4,451,247, Cl. 494-52.000.
Wickenhaeuser, Gerhard: *See*—
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Wickers, Francis A.; and Dorosz, Adolph S., to USM Corporation. Thread wiping mechanism. 4,450,781, Cl. 112-262.100.
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Steiner, Hansruedi, 4,450,952, Cl. 198-773.000.
Wieland, Clarence W. Child-resistant container. 4,450,972, Cl. 215-221.000.
Wietschorke, Stephan: *See*—
Sauerschell, Wolfgang; Wietschorke, Stephan; and Ruschek, Gerhard, 4,450,804, Cl. 123-366.000.
Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Phosphazenes useful as stabilizers in polymers. 4,451,400, Cl. 260-244.400.
Wildmann, Wolfgang; and Melzer, Rudolf, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Arrangement for lateral alignment of sheets. 4,451,029, Cl. 271-236.000.
Wiley, Bruce F., to Phillips Petroleum Company. Downhole sampling apparatus. 4,450,717, Cl. 73-151.000.
Wilfley, George M.: *See*—
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,451,155, Cl. 366-265.000.
Weber, Richard B.; Wilfley, George M.; and Wilfley, George M., 4,451,155, Cl. 366-265.000.
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Wilk, Hans-Christoph; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Water-dilutable lacquer binders based upon alkyd and acrylate resins. 4,451,596, Cl. 523-501.000.
Wilkerson, John L.: *See*—
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Wilkhahn & Hahne GmbH & Company: *See*—
Franck, Klaus; and Sauer, Werner, 4,451,085, Cl. 297-285.000.
Wilkins, Rennie F. T., to British Aluminium Company Limited, The. Direct chill casting apparatus. 4,450,887, Cl. 164-154.000.
Williams, John E., Jr., to AAKAC Industries, Inc. Torsion suspension system for motorcycles. 4,451,065, Cl. 280-284.000.
Williams, John F., to Du Pont de Nemours, E. I., and Company. Centrifuge bowl having rotor windage limited disposed thereon. 4,451,248, Cl. 494-84.000.
Williams, Marvin E. Comprehensive, central scheduling folder for project management. 4,451,067, Cl. 281-31.000.
Williams, Ronald A.: *See*—
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Willmund, Wolf-Dieter; Biermann, Manfred; Baumann, Horst; Friese, Hans-Herbert; and Pieper, Friedrich, to Henkel KGaA. Preparation of lubricating agents for leathers and furs. 4,451,261, Cl. 8-94.220.
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Wilson, Donald C., to PMC Corporation. Apparatus for removing rot from potatoes. 4,450,760, Cl. 99-536.000.
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Winden, Joseph, to Urban Systems Streetscape, Inc. Litter container. 4,450,974, Cl. 220-1.00T.
Winkelman, Max D., to Bell Telephone Laboratories, Incorporated. Switching system auxiliary line transfer circuit. 4,451,704, Cl. 179-18.00F.
Winkler, Ottmar; and Pfaller, Egon, to SKF Kugellagerfabriken GmbH. Rotary piston apparatus. 4,451,215, Cl. 418-23.000.
Winter, Joseph; Tyler, Derek E.; and Dantzig, Jonathan A., to International Telephone and Telegraph Corporation. Method and apparatus for casting metals and alloys. 4,450,893, Cl. 164-468.000.
Wirts, Harold L.: *See*—
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Wisseroth, Karl, to BASF Aktiengesellschaft. Gaining access to very deep coal seams by carrying explosive in density controlled fluid. 4,451,088, Cl. 299-11.000.
Wittbrodt, Donald R.: *See*—
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Wittes, James M. Pushbutton lock. 4,451,713, Cl. 179-189.00D.
Witzgall, Manfred: *See*—
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Woestman, John W.: *See*—
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Wolert, Hartmut: *See*—
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Wolfe, Donald W.; and Dye, Richard W., Jr., to General Electric Company. High speed search system. 4,451,901, Cl. 364-900.000.
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Wolfrum, Erhard; Erken, Manfred; and Bocker, Dietrich, to Rheinische Braunkohlenwerke AG. Process for removing noxious substances containing fluorine and/or sulfur from gaseous or liquid media. 4,450,777, Cl. 110-342.000.
Wolstenholme, Jack: *See*—
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Wong, Andrew H.: *See*—
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Wong, Dennis W. Prophylaxis and treatment of thromboembolic disorders in man and in warm-blooded animals with bicarbonate salts of alkali metals. 4,451,454, Cl. 424-127.000.
Wong, Roy; Pedginski, James J.; and Wong, Andrew H., to Minnesota Mining and Manufacturing Company. Dispensable polypropylene adhesive-coated tape. 4,451,533, Cl. 428-337.000.
Wood, Chester W., to Dover Corporation. Modular fluid dispensing nozzle. 4,450,879, Cl. 141-209.000.
Wood, Jonathan G. Silo unloader. 4,451,192, Cl. 414-306.000.
Wood, Joseph A., to Flanders Filters, Inc. Protective plastic bag and method of utilizing the same to remove articles from a hepa filter housing. 4,450,964, Cl. 206-527.000.
Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,450,956, Cl. 206-188.000.
Wood, Robert L., to Advanced Sports Corp. Aquatic mat. 4,451,240, Cl. 441-129.000.
Woodman, Daniel W., Jr.: *See*—
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Woods, Craig P.: *See*—
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Woods, Jack L.; Woods, Craig P.; and Woods, Richard L. Method for producing full color images on aluminum. 4,451,335, Cl. 204-35.00N.
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Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., to USM Corporation. Component inserting machine. 4,450,619, Cl. 29-564.100.
Wroblowa, Halina S.: *See*—
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Wulleweber, Heinz, to Metallgesellschaft Aktiengesellschaft. Filter-press type electrolyzer for water. 4,451,347, Cl. 204-258.000.
Wurttembergische Parfumerie-Fabrik GmbH: *See*—
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Xerox Corporation: *See*—
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Holmes, Maurice F.; and Garavuso, Gerald M., 4,451,028, Cl. 271-11.000.
Teeter, Dennis P.; and Ford, Brian R., 4,451,030, Cl. 271-265.000.

Yaegashi, Takehisa: *See*—
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Yagishita, Aisaburo; Mori, Noboru; Kusumi, Kinshiro; and Tsugi, Yoshio, to Kabushiki Kaisha Sanshin Seisakusho. Method and system for recycling washing liquids and the heat contained therein. 4,451,298, Cl. 134-10.000.

Yamada, Takaaki, to Sony Corporation. Phase comparator. 4,451,794, Cl. 328-134.000.

Yamada, Tominori: *See*—
Yamato, Isao; and Yamada, Tominori, 4,451,212, Cl. 417-313.000.

Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; Yamamoto, Kiyomi; Yoshiyasu, Hajimu; and Wada, Yuichi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,451,718, Cl. 200-147.00R.

Yamaguchi, Hiroshi: *See*—
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Yamaguchi, Hisao; Fujisawa, Kazuo; Kadowaki, Takashi; Itoh, Susumu; Sasaki, Soji; and Sato, Ichiya, to Hitachi, Ltd.; and Sumitomo Metal Industries, Ltd. Electromagnetic-acoustic measuring apparatus. 4,450,725, Cl. 73-643.000.

Yamaguchi, Shinji: *See*—
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Yamakage, Tetsuro, to Toyoda Koki Kabushiki Kaisha. Boring tool holder with probes for measuring bore. 4,451,185, Cl. 408-2.000.

Yamamoto, Katsutoshi: *See*—
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Yamamoto, Kazuo: *See*—
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Yamamoto, Keisuke: *See*—
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Masuda, Mitsuya; Iyehara, Sadahiro; Inohara, Shizuo; Ueda, Minoru; and Yamamoto, Keisuke, 4,451,852, Cl. 358-230.000.

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Yamamoto, Satoshi; Hase, Osamu; and Kawata, Tamostu, to Yukamelamin Company, Limited. Method of separating liquid drops from off gas. 4,451,271, Cl. 55-84.000.

Yamashina Seiko-Sho, Ltd.: *See*—
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Yamashita, Hiromichi; Watari, Yoshiharu; Mutsuro, Hideaki; and Takagi, Kenji, to Teijin Limited; and Penta-Ocean Construction Co., Ltd. Method for improving soft ground by sand drain method and cylindrical bag for use in same. 4,451,175, Cl. 405-50.000.

Yamashita, Katsuji; Umetsu, Hiroshi; Sato, Hirotaka; Matsuoka, Yoshio; and Kida, Kei, to Hitachi, Ltd. Automatic chemical analyzer. 4,451,433, Cl. 422-63.000.

Yamashita, Mitsuyasu; Igarashi, Hiroshi; and Koga, Shosuke, to NGK Insulators, Ltd.; and Kobayashi Institute of Physical Research. Structure for decreasing low frequency air vibration. 4,450,931, Cl. 181-198.000.

Yamashita, Seizi: *See*—
Tahara, Kazuo; Matsui, Takayuki; Koharagi, Haruo; Yamashita, Seizi; and Takahashi, Noriyoshi, 4,451,752, Cl. 310-186.000.

Yamato, Isao; and Yamada, Tominori, to Mitsui Engineering & Shipbuilding Co. Ltd. Pumping system for oil production. 4,451,212, Cl. 417-313.000.

Yamato, Motoyuki; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Epoxy resin composition. 4,451,637, Cl. 528-115.000.

Yamauchi, Takashi: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,451,674, Cl. 568-639.000.

Yamazaki, Isao, to Sony Corporation. Display apparatus for simultaneous display of character information having different character pitches. 4,451,899, Cl. 364-900.000.

Yamazaki, Shunpei. Semiconductor photoelectric conversion device. 4,451,838, Cl. 357-2.000.

Yamazaki, Yoshio: *See*—
Fukuchi, Masakazu; Oishi, Keiji; and Yamazaki, Yoshio, 4,451,134, Cl. 355-3.0DD.

Yan, Chan F , to W. Haking Enterprises Limited. Disc camera with handle grip cover. 4,451,130, Cl. 354-82.000.

Yanagawa, Nobuyuki; and Kamiyama, Shinichi, to Ricoh Company, Ltd. Cleaning apparatus for photoconductive element. 4,451,139, Cl. 355-15.000.

Yanagida, Tuneo; and Kato, Kiichi, to Olympus Optical Company Limited. Information reproducing apparatus based on opto-magnetic effect. 4,451,863, Cl. 360-114.000.

Yanagisawa, Masanobu: *See*—
Ono, Masaaki; Fujiwara, Yoshiro; and Yanagisawa, Masanobu, 4,451,805, Cl. 333-195.000.

Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., to Olin Corporation. Process and apparatus for electromagnetic casting of multiple strands having individual head control. 4,450,890, Cl. 164-452.000.

Yasuda, Naohiko; Okutsu, Masaru; Iwagami, Hisao; Nakamiya, Teruaki; and Takase, Ichiro, to Ajinomoto Company, Inc. Imidazolecarboxylic acid derivatives. 4,451,399, Cl. 260-239.100.

Yasuda, Yoshinori: *See*—
Ogawa, Koji; Taguchi, Hiroaki; Tsutsumi, Takao; Yasuda, Yoshinori; and Takase, Akio, 4,451,043, Cl. 273-186.00R.

Yasumura, Satoshi, to Trio Kabushiki Kaisha. Volume control apparatus. 4,451,796, Cl. 330-127.000.

Yasumuro, Hisakazu: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,451,316, Cl. 156-274.600.

Yawata, Shigeo: *See*—
Hiraki, Shunichi; Kikuchi, Kiyoshi; Yawata, Shigeo; and Miyagawa, Masafumi, 4,451,303, Cl. 148-187.000.

Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, to Toyo Seikan Kaisha, Ltd. Multi-layer plastic vessel. 4,451,512, Cl. 428-36.000.

Yazawa, Kouzou: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,042, Cl. 273-171.000.

Yeh, James T., to International Business Machines Corporation. Electrode treatment for plasma patterning of polymers. 4,451,349, Cl. 204-298.000.

Yokono, Hitoshi: *See*—
Kataoka, Fumio; Shoji, Fusaji; Obara, Isao; Yokono, Hitoshi; Isogai, Tokio; and Kojima, Mitumasa, 4,451,551, Cl. 430-270.000.

Yokota, Mitsuyoshi: *See*—
Iwaki, Yoshiyuki; Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,451,776, Cl. 322-22.000.

Yokoyama, Hiroshi: *See*—
Namba, Yuzuru; Aoyagi, Kenichi; and Yokoyama, Hiroshi, 4,450,803, Cl. 123-308.000.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Gain-controlled amplifier. 4,451,798, Cl. 330-254.000.

Yoneda, Haruyuki: *See*—
Ikegami, Tadashi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,451,573, Cl. 502-113.000.

Yonezawa, Kazuya; Kira, Kazuaki; Wakabayashi, Hiroshi; and Nagano, Hirosaku, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Heat resistant resin composition comprising modified polyamide-imide resin having carboxyl groups. 4,451,621, Cl. 525-426.000.

Yoshida, Hajime, to Hajime Industries Ltd. Pattern discrimination method. 4,451,929, Cl. 382-15.000.

Yoshida Kogyo K.K.: *See*—
Matsuda, Yoshio; Hata, Masahiko; and Ogihara, Toru, 4,450,694, Cl. 66-193.000.

Yoshida, Masazumi: *See*—
Kawamura, Takao; and Yoshida, Masazumi, 4,451,546, Cl. 430-69.000.

Yoshikawa, Masayuki: *See*—
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,041, Cl. 273-167.00H.
Hayashi, Keijiro; Awano, Toshimi; Yoshikawa, Masayuki; Yazawa, Kouzou; and Ito, Takashi, 4,451,042, Cl. 273-171.000.

Yoshikawa, Sumio: *See*—
Takenaka, Yuji; and Yoshikawa, Sumio, 4,451,142, Cl. 355-55.000.

Yoshikumi, Chikao; Sakurai, Katsuo; Omura, Yoshio; Nohara, Mayumi; Ando, Takao; and Motokawa, Isamu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cyclodextrin and method for promoting the proliferation of intestinal bifidobacteria. 4,451,457, Cl. 424-180.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Takada, Takuzo; Sugirua, Hiroaki; and Ilzuka, Takao, 4,450,878, Cl. 141-48.000.

Yoshio, Toshihiko: *See*—
Ito, Hiroshi; Yoshio, Toshihiko; and Nagashima, Masao, 4,450,611, Cl. 29-156.8FC.

Yoshioka, Takeo: *See*—
Okabe, Mitsuyasu; Yoshioka, Takeo; Fukagawa, Yasuo; Okamoto, Rokuro; Kouno, Kageaki; and Ishikura, Tomoyuki, 4,451,401, Cl. 260-245.20T.

Yoshioka, Tsutomu: *See*—
Miura, Toshikatu; Kikuchi, Hiroto; Okada, Yukio; and Yoshioka, Tsutomu, 4,451,518, Cl. 428-137.000.

Yoshiyasu, Hajimu: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; Yamamoto, Kiyomi; Yoshiyasu, Hajimu; and Wada, Yuichi, 4,451,718, Cl. 200-147.00R.

Young, Alan C.: *See*—
Lucas, James G.; Young, Alan C.; and Hinds, Paul M., 4,451,830, Cl. 343-768.000.

Young, Virgel J.; and Myers, Harry S., Jr., to United States of America, Navy. Automatic strobe/camera control unit. 4,451,847, Cl. 358-99.000.

Youngstown Steel Door Co., The: *See*—
Fritz, William E.; and McComb, Ronald J., 4,450,773, Cl. 105-282.00A.

Yu, Terry T., to Energy Conversion Devices, Inc. Tellurium imaging composition including base. 4,451,556, Cl. 430-346.000.

Yui, Ryosuki; Kume, Ketsuke; Hashi, Masaaki; and Niikura, Junji, to Sekisui Jushi Kabushiki Kaisha. Method for producing polyethylene terephthalate packing material. 4,451,422, Cl. 264-178.00R.

Yukamelamin Company, Limited: *See*—
Yamamoto, Satoshi; Hase, Osamu; and Kawata, Tamostu, 4,451,271, Cl. 55-84.000.

Zakai, Avi, to Mil Mutzarim Techniim B.M. Tube-diaphragm valve. 4,451,023, Cl. 251-5.000.

Zaporozhsky Konstruktorsko-Tekhnologichesky Institut Selskokhozyaistvennogo Mashinostroenia: *See*—
Erasov, Fedor N.; Chumachenko, Boris A.; and Potaichuk, Vladimir M., 4,451,216, Cl. 418-61.00B.

Zeilinger, Karl, to Daimler-Benz Aktiengesellschaft. Valve clearance compensator for internal combustion engines. 4,450,799, Cl. 123-90.530.

Zhivkova, Ljudmila V.: *See*—
Tarasov, Jury A.; Zhivkova, Ljudmila V.; Kotlyar, Anatoly M.; Panchokha, Vasily P.; Alexeenko, Natalia V.; Grabchenko, Anatoly I.; Lappo, Viktor G.; Boyarunas, Albert M.; Drozhin, Vitaly F.; Andreev, Anatoly A.; Gavrilko, Igor V.; Napadov, Mikhail A.; Padalka, Valentin G.; and Sapozhnikov, Abram L., 4,451,236, Cl. 433-207.000.

Zick, Gregory L.; and Saulson, Stanley H., to Cordis Corporation. Solid state reference electrode. 4,450,842, Cl. 128-635.000.

Zielinski, Walter J.: *See*—
Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., 4,451,488, Cl. 426-89.000.

Zielke, Michael W.: *See*—
Cook, Milton L.; Keyser, William L.; Swanson, Paul; Zielke, Michael W.; and Zielinski, Walter J., 4,451,488, Cl. 426-89.000.

Zimmer, Kurt, to Villeroy & Boch Keramische Werke KG. Method of applying color relief decorations to ceramic and like products. 4,451,307, Cl. 156-63.000.

Zimmerman, James. Mixing device. 4,451,154, Cl. 366-186.000.

Ziv, Avraham, to American Safety Equipment Corporation. Automatic locking safety belt retraction apparatus with resetting means. 4,451,062, Cl. 280-806.000.

Zukausky, Keith E., to Eaton Corporation. Venturi power supply and actuator system. 4,450,696, Cl. 68-18.0FA.

Zukausky, Keith E., to Eaton Corporation. Electromagnetic device. 4,451,809, Cl. 335-255.000.

Zulliger, Hans-Rudolf, to Mettler Instrumente AG. Dynamometer transducer utilizing an amorphous metal. 4,451,817, Cl. 338-47.000.

Zuniga, Michael A., to Mid Coast Electronics. Magnetic safety receptacle and plug. 4,451,113, Cl. 339-12.00R.

Zurcher Kantonalbank: *See*—
Burtscher, Paul, 4,451,416, Cl. 264-46.600.

Zutter, Hans: *See*—
Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, 4,451,478, Cl. 424-273.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Boeing Company, The: *See*—
Drakeley, George T., Re. 31,591, Cl. 244-110.00B.

Drakeley, George T., to Boeing Company, The. Fuselage tail jet engine thrust reverser and method. Re. 31,591, Cl. 244-110.00B.

Heilenz, Siegfried. Method and apparatus for operating a water-jet pump. Re. 31,592, Cl. 417-54.000.

Mitsui, Michio, to Ransburg Japan, Ltd. Atomization in electrostatic coating. Re. 31,590, Cl. 427-31.000.

Ransburg Japan, Ltd.: *See*—
Mitsui, Michio, Re. 31,590, Cl. 427-31.000.

LIST OF DESIGN PATENTEES

A G Motor Corp.: *See*—
Skaff, Ronald V.; and Giobbi, William, 274,063, Cl. D15-30.000.

Abraham, Nusri M., to Corbron Foundries. Bottle. 274,039, 5-29-84, Cl. D9-323.000.

Allibert S.A.: *See*—
Boroch, Jersy, 274,023, Cl. D6-86.000.
Boroch, Jersy, 274,026, Cl. D6-99.000.

American Safety Razor Company: *See*—
Iten, Clemens A., 274,010, Cl. D28-47.000.

Anthos S.A.: *See*—
Bulgari, Giovanni, 274,042, Cl. D10-18.000.

Argentina, Joseph N. Drain box. 274,004, 5-29-84, Cl. D25-55.000.

Au, Albert K. H.: *See*—
Wong, Ka W.; and Au, Albert K. H., 274,048, Cl. D10-106.000.

Barowa, Robert C. Adjustable wing mirror attachable to the rear view mirror of an automobile, or similar article. 274,054, 5-29-84, Cl. D12-187.000.

Bennet, W. Fletcher, to Sontek Industries, Inc. Patient communicator. 274,060, 5-29-84, Cl. D14-68.000.

Bland, Fred N. Water walker. 274,078, 5-29-84, Cl. D21-238.000.

Boroch, Jersy, to Allibert S.A. Bathroom shelf. 274,023, 5-29-84, Cl. D6-86.000.

Boroch, Jersy, to Allibert S.A. Wall-mounted towel rack. 274,026, 5-29-84, Cl. D6-99.000.

Brandsaeter, Helge, to Geophysical Company of Norway A/S. Towable buoyant body. 274,050, 5-29-84, Cl. D12-300.000.

Bridgestone Tire Company Limited: *See*—
Ohkuni, Shinichiro; and Nishio, Hideaki, 274,051, Cl. D12-146.000.

Brunko, Randy G. Sectional puzzle. 274,074, 5-29-84, Cl. D21-107.000.

Bryant, Peter D.: *See*—
Emms, Norman R.; and Bryant, Peter D., 274,071, Cl. D21-149.000.
Emms, Norman R.; and Bryant, Peter D., 274,072, Cl. D21-63.000.

Bulgari, Giovanni, to Anthos S.A. Traveling clock. 274,042, 5-29-84, Cl. D10-18.000.

Bunn-O-Matic Corporation: *See*—
Daugherty, Donald L., 274,029, Cl. D7-309.000.

Burruss, Harrison. Safety flush valve fitting for automotive air conditioner. 274,082, 5-29-84, Cl. D23-21.000.

Burruss, Harrison. Safety flush valve fitting for automotive air conditioner. 274,083, 5-29-84, Cl. D23-21.000.

Byers, Bruce E. Combined seat and detachable tray for a child. 274,020, 5-29-84, Cl. D6-12.000.

Cadbury Schweppes PLC: *See*—
Jeans, Robina E., 274,028, Cl. D7-308.000.

Caldwell, John W., to Pacific Furniture Manufacturing Company. Chair. 274,022, 5-29-84, Cl. D6-69.000.

Carlsson, Ake: *See*—
Nilsson, Hans E.; and Carlsson, Ake, 274,088, Cl. D23-77.000.

Carter, Dale. Audio speaker cabinet. 274,057, 5-29-84, Cl. D14-33.000.

Caruso, Richard. Hair clip. 274,009, 5-29-84, Cl. D28-39.000.

Cassai, Gino H.; and Cassai, Henry J. Adjustable cosmetic applicator. 274,008, 5-29-84, Cl. D28-7.000.

Cassai, Henry J.: *See*—
Cassai, Gino H.; and Cassai, Henry J., 274,008, Cl. D28-7.000.

Combi Co. Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshiun, 274,097, Cl. D24-34.000.

Conti, Rino: *See*—
Daenen, Robert H. C. M.; and Conti, Rino, 274,030, Cl. D7-391.000.

Corbron Foundries: *See*—
Abraham, Nusri M., 274,039, Cl. D9-323.000.

Crim, Phillip A.; Hawkins, Larry S.; and Szablak, Michael J., to Rubbermaid Commercial Products Inc. Hanger bracket for pocket file. 274,037, 5-29-84, Cl. D8-373.000.

Daenen, Robert H. C. M.; and Conti, Rino, to Dart Industries Inc. Cover for a food storage container or the like. 274,030, 5-29-84, Cl. D7-391.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Conti, Rino, 274,030, Cl. D7-391.000.

Daugherty, Donald L., to Bunn-O-Matic Corporation. Coffee making machine. 274,029, 5-29-84, Cl. D7-309.000.

de Man, Heiko T., to Gamble, Inc. Liquor dispensing head. 274,031, 5-29-84, Cl. D7-398.000.

Djurina, John. Fencing. 274,006, 5-29-84, Cl. D25-38.000.

Dobbs, J. Edward, III, to Golden Eagle Enterprises Inc. Towel-tie bar. 274,025, 5-29-84, Cl. D6-99.000.

Doe, Walter P. Pull toy. 274,075, 5-29-84, Cl. D21-150.000.

Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 274,053, Cl. D12-126.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 274,066, Cl. D19-92.000.
Evenson, Mel, 274,067, Cl. D19-92.000.

Emms, Norman R.; and Bryant, Peter D., to Hestair Kiddicraft Limited. Child's crib toy. 274,071, 5-29-84, Cl. D21-149.000.

Emms, Norman R.; and Bryant, Peter D., to Hestair Kiddicraft Limited. Child's crib toy. 274,072, 5-29-84, Cl. D21-63.000.

Engelhardt, Philip L. Cuff link. 274,017, 5-29-84, Cl. D2-422.000.

Evenson, Mel, to Eldon Industries, Inc. Desk tray. 274,066, 5-29-84, Cl. D19-92.000.

Evenson, Mel, to Eldon Industries, Inc. Paper tray. 274,067, 5-29-84, Cl. D19-92.000.

Everlast World's Boxing Headquarters Corp.: *See*—
Golomb, John C., 274,015, Cl. D2-361.000.

Fayram, Richard: *See*—
Hall, Jack P.; Fayram, Richard; and Muscatine, Jeffrey, 274,059, Cl. D14-54.000.

Fromm, Stephen J. Dispenser for playing cards or the like. 274,069, 5-29-84, Cl. D21-57.000.

Fukuoka Paper Manufacturing Co., Ltd.: *See*—
Kato, Hideo, 274,041, Cl. D9-434.000.

G & R Machine & Vending, Inc.: *See*—
Schraml, Eugene C., 274,036, Cl. D8-370.000.

Gamble, Inc.: *See*—
de Man, Heiko T., 274,031, Cl. D7-398.000.

Geophysical Company of Norway A/S: *See*—
Brandsaeter, Helge, 274,050, Cl. D12-300.000.

Giobbi, William: *See*—
Skaff, Ronald V.; and Giobbi, William, 274,063, Cl. D15-30.000.

Golden Eagle Enterprises Inc.: *See*—
Dobbs, J. Edward, III, 274,025, Cl. D6-99.000.

Golomb, John C., to Everlast World's Boxing Headquarters Corp. Boxing glove. 274,015, 5-29-84, Cl. D2-361.000.

Goutchat, Maurice. Combined holder for visiting cards, memo sheets and a writing instrument. 274,065, 5-29-84, Cl. D19-78.000.

Gravity Guidance, Inc.: *See*—
Miller, Jack V., 274,076, Cl. D21-191.000.

Gross, Bill. Loudspeaker. 274,058, 5-29-84, Cl. D14-34.000.

Hall, Dale E. Combined fish hook set and fish line snubber. 274,080, 5-29-84, Cl. D22-30.000.

Hall, Jack P.; Fayram, Richard; and Muscatine, Jeffrey, to Harris Corporation. Housing for a graphic telephone. 274,059, 5-29-84, Cl. D14-54.000.

Hansen, Elmer K. Cropper platform for a tobacco harvesting machine. 274,062, 5-29-84, Cl. D15-27.000.

Harris Corporation: *See*—
Hall, Jack P.; Fayram, Richard; and Muscatine, Jeffrey, 274,059, Cl. D14-54.000.

Hawkins, Larry S.: *See*—
Crim, Phillip A.; Hawkins, Larry S.; and Szablak, Michael J., 274,037, Cl. D8-373.000.

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Emms, Norman R.; and Bryant, Peter D., 274,071, Cl. D21-149.000.
Emms, Norman R.; and Bryant, Peter D., 274,072, Cl. D21-63.000.
Hirose, Mutsuo: *See*—
Iwakura, Masato; Hirose, Mutsuo; and Yamada, Toshiyuki, 274,052, Cl. D12-110.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iwakura, Masato; Hirose, Mutsuo; and Yamada, Toshiyuki, 274,052, Cl. D12-110.000.
Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 274,064, Cl. D17-21.000.
Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Tailpiece for guitar. 274,064, 5-29-84, Cl. D17-21.000.
Howmedica, Inc.: *See*—
Kenna, Robert V., 274,090, Cl. D24-26.000.
Kenna, Robert V., 274,091, Cl. D24-26.000.
Kenna, Robert V., 274,092, Cl. D24-26.000.
Kenna, Robert V., 274,093, Cl. D24-26.000.
Kenna, Robert V., 274,094, Cl. D24-26.000.
Kenna, Robert V., 274,095, Cl. D24-26.000.
Infrarodteknik AB: *See*—
Nilsson, Hans E.; and Carlsson, Ake, 274,088, Cl. D23-77.000.
International Laser Systems, Inc.: *See*—
Morris, James F., Jr.; Visovatti, Ramon; and Wangler, Richard J., 274,089, Cl. D24-8.000.
Ishii, Kenshiun: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshiun, 274,097, Cl. D24-34.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshiun, 274,097, Cl. D24-34.000.
Iten, Clemens A., to American Safety Razor Company. Sleeve for a disposable safety razor. 274,010, 5-29-84, Cl. D28-47.000.
Iwakura, Masato; Hirose, Mutsuo; and Yamada, Toshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 274,052, 5-29-84, Cl. D12-110.000.
Iwasa, Naotoshi: *See*—
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J.A.R. Sales, Inc.: *See*—
Tung, Tonney, 274,073, Cl. D21-107.000.
Jeans, Robina E., to Cadbury Schweppes PLC. Beverage dispenser. 274,028, 5-29-84, Cl. D7-308.000.
Kasai, Kazumi, to Yoshida Kogyo K.K. Slide fastener chain. 274,016, 5-29-84, Cl. D2-415.000.
Kato, Hideo, to Fukuoka Paper Manufacturing Co., Ltd. Corner pad. 274,041, 5-29-84, Cl. D9-434.000.
Kaufman, Jack W. Disposable swab applicator package with standby reservoir. 274,098, 5-29-84, Cl. D24-34.000.
Kayline Enterprises, Inc.: *See*—
Reiner, Kenneth, 274,014, Cl. D34-21.000.
Kenna, Robert V., to Howmedica, Inc. Transverse tibial cutting jig for the implantation of a prosthetic knee. 274,090, 5-29-84, Cl. D24-26.000.
Kenna, Robert V., to Howmedica, Inc. Femoral chamfer cutting jig for the implantation of a prosthetic knee. 274,091, 5-29-84, Cl. D24-26.000.
Kenna, Robert V., to Howmedica, Inc. Femoral chamfer cutting jig for the implantation of a prosthetic knee. 274,092, 5-29-84, Cl. D24-26.000.
Kenna, Robert V., to Howmedica, Inc. Femoral spacer/tensor jig for the implantation of a prosthetic knee. 274,093, 5-29-84, Cl. D24-26.000.
Kenna, Robert V., to Howmedica, Inc. Tibial positioning/fixation jig for the implanation of a prosthetic knee. 274,094, 5-29-84, Cl. D24-26.000.
Kenna, Robert V., to Howmedica, Inc. Femoral drill jig for the implantation of a prosthetic knee. 274,095, 5-29-84, Cl. D24-26.000.
Keystone Consolidated Industries, Inc.: *See*—
Pawlow, Valentin, 274,035, Cl. D8-316.000.
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Yanagi, Sori, 274,084, Cl. D23-30.000.
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Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,045, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,046, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,047, Cl. D10-74.000.
Knemeyer, Siegfried, deceased: *See*—
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,044, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,045, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,046, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,047, Cl. D10-74.000.
Laboratoires Prodene-Klint: *See*—
Vignot, Andre, 274,024, Cl. D6-95.000.
Lacina, Erciel F. Work piece protecting pad for use on a bar clamp, or similar article. 274,034, 5-29-84, Cl. D8-72.000.
Lafferty, Thomas G. Foam generator for a cleaning machine. 274,011, 5-29-84, Cl. D32-01.000.
Lai, Kwok C. Multi-purpose hand tool. 274,032, 5-29-84, Cl. D8-55.000.
Lengacher, Eli. Lamp. 274,007, 5-29-84, Cl. D26-93.000.
Long, Rubina M.: *See*—
Porter, Harvey; and Long, Rubina M., 274,005, Cl. D25-87.000.
Ma, Hansan, to Milton Bradley International, Inc. Ball toy. 274,070, 5-29-84, Cl. D21-59.000.
Marker-Patentverwertungsgesellschaft mbH.: *See*—
Segers, Hermann R.; and Schultes, Herbert H., 274,077, Cl. D21-230.000.
Mattel, Inc.: *See*—
Wong, Ka W.; and Au, Albert K. H., 274,048, Cl. D10-106.000.
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Ma, Hansan, 274,070, Cl. D21-59.000.
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Hall, Jack P.; Fayram, Richard; and Muscatine, Jeffrey, 274,059, Cl. D14-54.000.
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Ohkuni, Shinichiro; and Nishio, Hideaki, 274,051, Cl. D12-146.000.
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Yanagi, Sori, 274,086, Cl. D23-30.000.
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Suzuki, Masatsugu; and Iwasa, Naotoshi, 274,061, Cl. D14-94.000.
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Caldwell, John W., 274,022, Cl. D6-69.000.
Paine, Larry W. Differential temperature control. 274,043, 5-29-84, Cl. D10-50.000.
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Schmidt, Donald F.; and Knemeyer, Siegfried, deceased, 274,047, Cl. D10-74.000.
Royal Factories, Inc.: *See*—
Porter, Harvey; and Long, Rubina M., 274,005, Cl. D25-87.000.
Rubbermaid Commercial Products Inc.: *See*—
Crim, Phillip A.; Hawkins, Larry S.; and Szablak, Michael J., 274,037, Cl. D8-373.000.
Schaefer Marine, Inc.: *See*—
Merry, Carl A., 274,038, Cl. D8-382.000.
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Schmidt, Donald F.; and Knemeyer, Siegfried, deceased (by Knemeyer, Doris R., administrator), to Rockwell International Corporation. Attitude director indicator. 274,045, 5-29-84, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased (by Knemeyer, Doris R., administrator), to Rockwell International Corporation. Attitude director indicator. 274,046, 5-29-84, Cl. D10-74.000.
Schmidt, Donald F.; and Knemeyer, Siegfried, deceased (by Knemeyer, Doris R., administrator), to Rockwell International Corporation. Attitude director indicator. 274,047, 5-29-84, Cl. D10-74.000.
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Skaff, Ronald V.; and Giobbi, William, to A G Motor Corp. Yard tractor cab. 274,063, 5-29-84, Cl. D15-30.000.
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Crim, Phillip A.; Hawkins, Larry S.; and Szablak, Michael J., 274,037, Cl. D8-373.000.
Thompson, Bruce R. Towel holder. 274,027, 5-29-84, Cl. D6-99.000.
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Wangler, Richard J.: *See*—
Morris, James F., Jr.; Visovatti, Ramon; and Wangler, Richard J., 274,089, Cl. D24-8.000.
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Yanagi, Sori, to NSK-Warner K.K. Valve handwheel. 274,086, 5-29-84, Cl. D23-30.000.
Yanagi, Sori, to KITZ Corporation. Valve handwheel. 274,087, 5-29-84, Cl. D23-30.000.
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Kasai, Kazumi, 274,016, Cl. D2-415.000.

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Keller, Emil, 5,239, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 29, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3

1.9	4,450,591
1.912	4,450,592
13	4,450,593

CLASS 4

228	4,450,594
301	4,450,595
447	4,450,596

CLASS 5

2 R	4,450,597

CLASS 8

94.22	4,451,261
125	4,451,262
500	4,451,263
508	4,451,254

CLASS 14

71.1	4,450,598

CLASS 15

22 R	4,450,599
53 A	4,450,600
246	4,450,601
250.32	4,450,602

CLASS 24

132 R	4,450,603
457	4,450,605
652	4,450,604

CLASS 28

257	4,450,607

CLASS 29

33 R	4,450,608
156.4 R	4,450,609
156.5 R	4,450,610
156.8 FC	4,450,611
157 T	4,450,613
417	4,450,614
430	4,450,617
437	4,450,615
446	4,450,616
509	4,450,618
564.1	4,450,619
571	4,450,620
828	4,450,621
842	4,450,622
850	4,450,623
881	4,450,624

CLASS 30

134	4,450,625
226	4,450,626
391	4,450,627

CLASS 33

172 E	4,450,628
184.5	4,450,629

CLASS 34

110	4,450,631
116	4,450,630

CLASS 36

17 PW	4,450,632
101	4,450,633
138	4,450,634

CLASS 37

271	4,450,635

CLASS 40

152	4,450,636
	4,450,637
158 R	4,450,638
322	4,450,639
596	4,450,640

CLASS 42

6	4,450,641

CLASS 43

3	4,450,642
12	4,450,643
42.2	4,450,644
42.25	4,450,645
43.14	4,450,646
55	4,450,647
64	4,450,648
135	4,450,649

CLASS 44

51	4,451,265
53	4,451,266
	4,451,267

CLASS 46

17	4,450,650

CLASS 48

3 A	4,451,268

CLASS 51

5 D	4,450,651
131.4	4,450,652
211 R	4,450,653
303	4,451,269

CLASS 52

12	4,450,654
36	4,450,655
63	4,450,656
79.9	4,450,657
126.3	4,450,658
167	4,450,659
202	4,450,660
206	4,450,661
223 R	4,450,662
309.4	4,450,663
385	4,450,664
522	4,450,665
749	4,450,666

CLASS 53

127	4,450,667
176	4,450,668
551	4,450,669

CLASS 55

38	4,451,270
84	4,451,271
390	4,451,272

CLASS 56

8	4,450,670
14.6	4,450,671
16.7	4,450,672
17.5	4,450,673

CLASS 57

6	4,450,674
	4,450,675
	4,450,676
81	4,450,677
333	4,450,678

CLASS 60

251	4,450,679
274	4,450,680
286	4,450,681
	4,450,682
290	4,450,683
	4,450,684
520	4,450,685
527	4,450,686
530	4,450,687
554	4,450,688
641.7	4,450,689

CLASS 62

12	4,451,273
17	4,451,274
28	4,451,275
116	4,450,690
140	4,450,691
233	4,450,692
514 R	4,450,693

CLASS 65

6	4,451,276

CLASS 66

193	4,450,694

CLASS 68

18 FA	4,450,696

CLASS 70

168	4,450,695
178	4,450,697
312	4,450,698
364 A	4,450,699

CLASS 71

36	4,451,277
66	4,451,278
90	4,451,280
92	4,451,281
	4,451,282
93	4,451,279
	4,451,283
94	4,451,284
105	4,451,285
107	4,451,226

CLASS 72

62	4,450,612
115	4,450,700
181	4,450,701
250	4,450,702
342	4,450,703
356	4,450,704
379	4,450,705
385	4,450,706
389	4,450,707
481	4,450,708

CLASS 73

35	4,450,709
37	4,450,710
40.5 R	4,450,711
61 R	4,450,712
81	4,450,713
118.1	4,450,714
	4,450,715
146.5	4,450,716
151	4,450,717
202	4,450,718
204	4,450,719
247	4,450,720
290 B	4,450,721
293	4,450,722
432 PS	4,450,723
432 R	4,450,724
643	4,450,725
861.35	4,450,726
862.23	4,450,727
862.28	4,450,728
862.34	4,450,729
866.61	4,450,730

CLASS 74

25	4,450,731
107	4,450,732
562	4,450,733
665 F	4,450,734
781 R	4,450,735

CLASS 75

24	4,451,287
60	4,451,288
63	4,451,289
	4,451,290
73	4,451,291
238	4,451,292
257	4,451,293

CLASS 81

463	4,450,736

CLASS 82

24 R	4,450,737
82	4,450,738

CLASS 83

23	4,450,739
303	4,450,740
623	4,450,741

CLASS 84

1.03	4,450,742
	4,450,743
1.16	4,450,744
1.19	4,450,745
1.24	4,450,746
220	4,450,747
291	4,450,748
462	4,450,749

CLASS 89

33 SF	4,450,750
129 B	4,450,751
142	4,450,752

CLASS 91

35	4,450,753

CLASS 92

138	4,450,754

CLASS 98

36	4,450,755
115 R	4,450,756

CLASS 99

327	4,450,757
332	4,450,758
419	4,450,759
536	4,450,760
580	4,450,761
584	4,450,762

CLASS 100

31	4,450,763
37	4,450,764

CLASS 101

11	4,450,765
183	4,450,766
365	4,450,767

CLASS 102

307	4,450,768
444	4,450,769
523	4,450,770

CLASS 104

1 R	4,450,771
295	4,450,772

CLASS 105

282 A	4,450,773

CLASS 106

75	4,451,294
89	4,451,295

CLASS 108

23	4,450,774
64	4,450,775

CLASS 110

233	4,450,776
342	4,450,777

CLASS 111

3	4,450,778
52	4,450,779

CLASS 112

147	4,450,780
262.1	4,450,781
266.1	4,450,782

CLASS 114

39	4,450,784

CLASS 118

626	4,450,785
719	4,450,786
723	4,450,787

CLASS 119

18	4,450,788
	4,450,789
51.12	4,450,790
61	4,450,791
126	4,450,792

CLASS 123

41.41	4,450,798
52 MB	4,450,793
74 R	4,450,794
78 F	4,450,797
79 C	4,450,795
	4,450,796
90.53	4,450,799
193 CH	4,450,800
198 F	4,450,801
245	4,450,802
308	4,450,803
366	4,450,804
387	4,450,805
401	4,450,806
403	4,450,807
417	4,450,808
421	4,450,809
425	4,450,810
	4,450,811
438	4,450,812
450	4,450,813
458	4,450,783
478	4,450,814
479	4,450,815
492	4,450,816
501	4,450,817
502	4,450,818
	4,450,819
514	4,450,820
525	4,450,821
	4,450,822
549	4,450,823
569	4,450,824
	4,450,825

CLASS 125

11 N	4,450,826

CLASS 126

298	4,450,827
343.5 A	4,450,828
362	4,450,829
450	4,450,830

CLASS 128

14	4,450,831
80 G	4,450,832
90	4,450,833
92 EB	4,450,834
	4,450,835
127	4,450,836
201.27	4,450,837
204.23	4,450,838
325	4,450,839
	4,450,840
632	4,450,841
635	4,450,842
690	4,450,843
743	4,450,844
	4,450,845
789	4,450,846

CLASS 131

365	4,450,847

CLASS 132

73	4,450,848
89	4,450,849

CLASS 134

4	4,451,296
9	4,451,297
10	4,451,298

CLASS 135

78	4,450,850
109	4,450,851

CLASS 136

201	4,451,690
249	4,451,691

CLASS 137

114	4,450,852
212	4,450,853
246.12	4,450,854
312	4,450,855
315	4,450,856
318	4,450,857
505.37	4,450,858
516.29	4,450,859
543.19	4,450,860
553	4,450,861
595	4,450,862
613	4,450,863
624.13	4,450,864
625.29	4,450,868
625.34	4,450,866
625.44	4,450,867
625.48	4,450,869
625.6	4,450,865

CLASS 138

31	4,450,870
140	4,450,871
149	4,450,872
174	4,450,873

CLASS 139

429	4,450,874
435	4,450,875
	4,450,876

CLASS 141

1	4,450,877
48	4,450,878
209	4,450,879
285	4,450,880

CLASS 144

84	4,450,881
145 A	4,450,882

CLASS 148

1	4,451,299
6.15 R	4,451,301
6.27	4,451,304
13.1	4,451,302
187	4,451,303

CLASS 156

49	4,451,305
51	4,451,306
63	4,451,307
64	4,451,308
	4,451,309
78	4,451,310
86	4,451,311
99	4,451,312
132	4,451,313
148	4,451,314
220	4,451,315
274.6	4,451,316
307.3	4,451,317
353	4,451,318
	4,451,319
366	4,451,320
382	4,451,321
461	4,451,322
541	4,451,323
562	4,451,324
583.1	4,451,325
643	4,451,326
646	4,451,327
656	4,451,328
660	4,451,329

CLASS 159

48.2	4,451,330

CLASS 160

229 R	4,450,883
371	4,450,884

CLASS 162

18	4,451,331
30.1	4,451,332
77	4,451,333

CLASS 164

47	4,450,885
75	4,450,886
154	4,450,887
183	4,450,888
361	4,450,889
452	4,450,890
463	4,450,891
467	4,450,892
468	4,450,893
484	4,450,894

CLASS 165

1	4,450,895
	4,450,896
2	4,450,897
25	4,450,898
39	4,450,899
42	4,450,900
47	4,450,901
82	4,450,902
110	4,450,903
162	4,450,904

CLASS 166

85	4,450,905
113	4,450,906
223	4,450,907
246	4,450,908
248	4,450,909
261	4,450,910
263	4,450,911
289	4,450,912
303	4,450,913
325	4,450,914

CLASS 172

55	4,450,915
147	4,450,916
328	4,450,917
583	4,450,918

CLASS 173

29 4,450,919
80 4,450,920
162 H 4,450,921

CLASS 174

23 C 4,451,692
52 R 4,451,693
72 B 4,451,694
87 4,451,695
92 4,451,696

CLASS 177

211 4,450,922
212 4,450,923
4,450,924

CLASS 178

3 4,451,697
19 4,451,698

CLASS 179

2 AS 4,451,700
2 EB 4,451,699
2 TV 4,451,701
18 ES 4,451,702
18 F 4,451,704
18 FA 4,451,703
27 D 4,451,705
81 R 4,451,706
84 R 4,451,707
98 4,451,708
107 S 4,451,709
110 A 4,451,710
146 E 4,451,711
175.3 R 4,451,712
189 D 4,451,713

CLASS 180

89.1 4,450,925
312 4,450,926
330 4,450,927

CLASS 181

121 4,450,928
146 4,450,929
158 4,450,930
198 4,450,931
211 4,450,932
228 4,450,934
229 4,450,933

CLASS 182

45 4,450,935
92 4,450,936
206 4,450,937

CLASS 184

42 4,450,938

CLASS 185

39 4,450,939

CLASS 188

67 4,450,606
71.3 4,450,940

CLASS 192

0.084 4,450,946
3.31 4,450,941
48.9 4,450,942
70.12 4,450,944
70.2 4,450,943
89 B 4,450,945
107 R 4,450,947

CLASS 198

389 4,450,948
422 4,450,949
478 4,450,950
482 4,450,951
773 4,450,952
778 4,450,953
793 4,450,954

CLASS 200

5 A 4,451,714
11 G 4,451,715
67 A 4,451,716
82 B 4,451,717
147 R 4,451,718
159 R 4,451,719
296 4,451,720

CLASS 203

11 4,451,334

CLASS 204

35 N 4,451,335
47 4,451,336
67 4,451,337
86 4,451,338
91 4,451,339
117 4,451,340
149 4,451,341
157.1 R 4,451,342
158 R 4,451,343
192 R 4,451,344
206 4,451,345
228 4,451,346
258 4,451,347
290 R 4,451,348
298 4,451,349
422 4,451,350

CLASS 206

39.6 4,450,955
188 4,450,956
220 4,450,957
222 4,450,958
332 4,450,959
334 4,450,960
349 4,450,961
447 4,450,962
521 4,450,963
527 4,450,964
528 4,450,965
547 4,450,966

CLASS 208

10 4,451,351
11 R 4,451,352
33 4,451,353
56 4,451,354
113 4,451,355
263 4,451,356

CLASS 209

131 4,451,357
144 4,451,358
158 4,451,359
230 4,451,360

CLASS 210

136 4,451,361
150 4,451,362
198.2 4,451,363
4,451,364
4,451,365
207 4,451,367
209 4,451,366
238 4,451,368
321.1 4,451,369
4,451,370
325 4,451,371
603 4,451,372
626 4,451,373
656 4,451,374
670 4,451,375
701 4,451,376
708 4,451,377
725 4,451,378
728 4,451,379
739 4,451,380

CLASS 211

13 4,450,967
17 4,450,968
189 4,450,969
4,450,970
201 4,450,971

CLASS 215

221 4,450,972
329 4,450,973

CLASS 219

10.43 4,451,721
86.25 4,451,722
98 4,451,723
390 4,451,725
413 4,451,726
464 4,451,727

CLASS 220

1 T 4,450,974
18 4,450,975
343 4,450,976
458 4,450,977

CLASS 221

13 4,450,978
263 4,450,979
281 4,450,980

CLASS 222

61 4,450,981
93 4,450,982
196 4,450,983
402.22 4,450,984
4,450,985
591 4,450,986
641 4,450,987

CLASS 224

32 A 4,450,988
42.45 R 4,450,989
155 4,450,990
159 4,450,991
163 4,450,992
265 4,450,993
277 4,450,994

CLASS 225

2 4,450,995
43 4,450,996

CLASS 226

97 4,450,997

CLASS 227

8 4,450,998

CLASS 228

20 4,451,000
176 4,450,999

CLASS 229

40 4,451,001

CLASS 235

50 R 4,451,728

CLASS 236

14 4,451,003
101 R 4,451,002

CLASS 239

658 4,451,004

CLASS 241

40 4,451,005

CLASS 242

18 DD 4,451,006
18 K 4,451,007
25 A 4,451,008
54 R 4,451,009
55.53 4,451,010
71 4,451,011
84.2 A 4,451,012
118.4 4,451,013
128 4,451,014

CLASS 244

15 4,451,015
107 4,451,016
110 B Re.31,591
172 4,451,017

CLASS 246

122 R 4,451,018

CLASS 248

1 4,451,019
183 4,451,020
480 4,451,021

CLASS 249

2 4,451,022

CLASS 250

204 4,451,729
227 4,451,730
237 SE 4,451,731
308 4,451,732
311 4,451,737
342 4,451,733
4,451,734
352 4,451,735
376 4,451,736
492.2 4,451,738
506.1 4,451,739

CLASS 251

5 4,451,023

CLASS 252

1 4,451,381
8.6 4,451,382
70 4,451,383
102 4,451,384
132 4,451,385
135 4,451,386
174.15 4,451,387
313 S 4,451,388
315.3 4,451,389
321 4,451,390
512 4,451,391
522 R 4,451,392
536 4,451,393

CLASS 254

104 4,451,024

CLASS 256

65 4,451,025

CLASS 260

112 R 4,451,396
112.5 S 4,451,394
112.5 T 4,451,395
123.7 4,451,397
154 4,451,398
239.1 4,451,399
244.4 4,451,400
245.2 T 4,451,401
396 N 4,451,403
397.1 4,451,405
397.45 4,451,404
465 D 4,451,406
465.4 4,451,407
505 R 4,451,408
513 R 4,451,409
973 4,451,410

CLASS 261

111 4,451,411

CLASS 264

1.3 4,451,412
26 4,451,413
40.5 4,451,414
43 4,451,415
46.6 4,451,416
53 4,451,417
63 4,451,418
164 4,451,419
167 4,451,420
4,451,421
178 R 4,451,422
182 4,451,423
216 4,451,424
300 4,451,425
535 4,451,426

CLASS 269

24 4,451,026

CLASS 271

10 4,451,027
11 4,451,028
236 4,451,029
265 4,451,030
303 4,451,031

CLASS 272

56.5 SS 4,451,032
73 4,451,033
93 4,451,034
137 4,451,035

CLASS 273

26 R 4,451,036
55 R 4,451,037
110 4,451,038
153 S 4,451,039
4,451,040
167 H 4,451,041
171 4,451,042
186 R 4,451,043
189 A 4,451,044
338 4,451,045

CLASS 277

3 4,451,046
26 4,451,047
27 4,451,048
42 4,451,049
134 4,451,050
235 B 4,451,051

CLASS 280

43.23 4,451,052
47.26 4,451,053
104 4,451,054
163 4,451,063
221 4,451,055
259 4,451,064
284 4,451,065
291 4,451,057
423 A 4,451,058
508 4,451,066
632 4,451,059
801 4,451,060
802 4,451,061
806 4,451,062

CLASS 281

31 4,451,067

CLASS 283

75 4,451,068

CLASS 285

3 4,451,056
86 4,451,069
242 4,451,070

CLASS 290

40 C 4,451,740

CLASS 292

128 4,451,072
341.18 4,451,071

CLASS 294

57 4,451,073

CLASS 296

1 S 4,451,074
37.6 4,451,075
97 K 4,451,076
185 4,451,077
188 4,451,078
190 4,451,079

CLASS 297

4 4,451,080
61 4,451,081
90 4,451,082
195 4,451,083
285 4,451,085
312 4,451,086
353 4,451,084
468 4,451,087

CLASS 299

11 4,451,088
43 4,451,089
4,451,090
4,451,091
81 4,451,092
88 4,451,093

CLASS 303

10 4,451,094
71 4,451,095
109 4,451,096

CLASS 305

40 4,451,097

CLASS 307

10 R 4,451,741
66 4,451,742
110 4,451,743
297 4,451,744
475 4,451,745
494 4,451,746
569 4,451,747
578 4,451,748

CLASS 308

184 R 4,451,110
201 4,451,098

CLASS 310

62 4,451,749
88 4,451,750
184 4,451,751
186 4,451,752
315 4,451,753
348 4,451,754
361 4,451,755

CLASS 312

221 4,451,111

CLASS 313

422 4,451,756
489 4,451,757
495 4,451,758
4,451,759
557 4,451,760
586 4,451,761

CLASS 315

87 4,451,762
159 4,451,763
209 R 4,451,764
248 4,451,765
4,451,766
309 4,451,767

CLASS 318

443 4,451,768
689 4,451,769
757 4,451,770
778 4,451,112
800 4,451,771

CLASS 320

1 4,451,772
59 4,451,773
64 4,451,774

CLASS 322

10 4,451,775
22 4,451,776

CLASS 323

210 4,451,777
282 4,451,778
312 4,451,779

CLASS 324

61 R 4,451,780
65 R 4,451,781
77 C 4,451,782
86 4,451,783
142 4,451,784
158 MG 4,451,786
158 R 4,451,785
242 4,451,787
309 4,451,788
338 4,451,789
351 4,451,790
434 4,451,791

CLASS 328

69 4,451,793
134 4,451,794

CLASS 329

145 4,451,792

CLASS 330

107 4,451,795
127 4,451,796
134 4,451,797
254 4,451,798
255 4,451,799
261 4,451,800
278 4,451,801
297 4,451,802

CLASS 333

12 4,451,803
177 4,451,804
195 4,451,805
224 4,451,806

CLASS 335

211 4,451,807
229 4,451,808
255 4,451,809
285 4,451,810
302 4,451,811

CLASS 336

84 C 4,451,812

CLASS 337

17 4,451,813
407 4,451,814

CLASS 338

21 4,451,815
34 4,451,816
47 4,451,817

CLASS 339

12 R 4,451,113
14 R 4,451,099
4,451,100
44 M 4,451,101
74 R 4,451,102
75 MP 4,451,818
93 R 4,451,103
99 R 4,451,104
113 R 4,451,105
123 4,451,106
143 R 4,451,107
177 R 4,451,108
258 S 4,451,109

CLASS 340

347 AD 4,451,821
347 DA 4,451,820
347 DD 4,451,819
642 4,451,822
648 4,451,823
720 4,451,824
750 4,451,825
825.07 4,451,826
825.52 4,451,827

CLASS 343

374 4,451,831
705 4,451,829
768 4,451,830
858 4,451,832
872 4,451,828
4,451,833

CLASS 346

76 PH 4,451,834
4,451,835
137 4,451,836
153.1 4,451,837

CLASS 350

3.75 4,451,114
96.18 4,451,115
96.34 4,451,116
114 4,451,117
310 4,451,118
4,451,119
319 4,451,120
331 R 4,451,121
334 4,451,122
386 4,451,123
427 4,451,124
465 4,451,125
520 4,451,126

CLASS 351

47 4,451,127

CLASS 352

84 4,451,128

CLASS 354

82 4,451,130
173.11 4,451,130
286 4,451,131
324 4,451,132
477 4,451,129

CLASS 355

3 DD 4,451,133
4,451,134
4,451,135
14 C 4,451,137
14 SH 4,451,136
4,451,138
15 4,451,139
4,451,140

28 4,451,141
55 4,451,142
66 4,451,143
99 4,451,144
100 4,451,145

CLASS 356

5 4,451,146
135 4,451,147
138 4,451,148
317 4,451,149
345 4,451,151
440 4,451,152

CLASS 357

2 4,451,838
13 4,451,839
23.6 4,451,841
30 4,451,842
36 4,451,843
59 4,451,844
72 4,451,845

CLASS 358

22 4,451,840
56 4,451,846
99 4,451,847
140 4,451,848
161 4,451,849
191.1 4,451,850
228 4,451,851
230 4,451,852
281 4,451,853
282 4,451,854
289 4,451,855
299 4,451,856
312 4,451,857

CLASS 360

32 4,451,858
75 4,451,859
77 4,451,860
84 4,451,861
109 4,451,862
114 4,451,863
130.33 4,451,864

CLASS 361

23 4,451,865
56 4,451,866
248 4,451,867
306 4,451,868
309 4,451,869
433 4,451,870

CLASS 362

186 4,451,871
251 4,451,872
267 4,451,873
285 4,451,874
297 4,451,875

CLASS 363

21 4,451,876
59 4,451,877

CLASS 364

151 4,451,878
181 4,451,879
200 4,451,880
4,451,881
4,451,882
4,451,883
4,451,884
4,451,885
4,451,886
424 4,451,887
426 4,451,888
4,451,889
4,451,890
431.12 4,451,891
474 4,451,892
494 4,451,893
509 4,451,894
521 4,451,895
569 4,451,896
900 4,451,897
4,451,898
4,451,899
4,451,900
4,451,901

CLASS 365

1 4,451,902
94 4,451,903
182 4,451,904
185 4,451,905
203 4,451,907
205 4,451,906
222 4,451,908

CLASS 366

13 4,451,153
186 4,451,154
265 4,451,155

CLASS 367

99 4,451,909
199 4,451,910

CLASS 368

10 4,451,156
11 4,451,157
63 4,451,158
69 4,451,159
220 4,451,161
290 4,451,160

CLASS 369

31 4,451,911
77.2 4,451,912
109 4,451,914
4,451,915
110 4,451,913

CLASS 370

16 4,451,916
108 4,451,917

CLASS 371

27 4,451,918
38 4,451,919
40 4,451,920
48 4,451,921
49 4,451,922

CLASS 372

32 4,451,923
59 4,451,924

CLASS 373

81 4,451,925
93 4,451,926

CLASS 376

267 4,451,427
333 4,451,428

CLASS 381

15 4,451,927
86 4,451,928

CLASS 382

15 4,451,929

CLASS 384

95 4,451,162
106 4,451,163

CLASS 400

196 4,451,164
196.1 4,451,165
208 4,451,166
621 4,451,167
623 4,451,168
631 4,451,169

CLASS 403

57 4,451,170

CLASS 404

31 4,451,171

CLASS 405

49 4,451,172
50 4,451,175
53 4,451,173
146 4,451,176
195 4,451,177
196 4,451,174
258 4,451,178
260 4,451,179
269 4,451,180
302 4,451,181

CLASS 406

86 4,451,182
94 4,451,183
105 4,451,184

CLASS 408

2 4,451,185
54 4,451,186

CLASS 409

187 4,451,187

CLASS 410

42 4,451,188

CLASS 411

34 4,451,189
337 4,451,190

CLASS 414

118 4,451,191
306 4,451,192
563 4,451,193
731 4,451,194
732 4,451,195
733 4,451,196
737 4,451,197
779 4,451,198

CLASS 415

2 A 4,451,199
110 4,451,200
181 4,451,201

CLASS 416

214 R 4,451,202
215 4,451,203
4,451,204
219 R 4,451,205
228 4,451,206
237 4,451,208
237 R 4,451,207

CLASS 417

38 4,451,209
52 4,451,210
54 Re.31,592
271 4,451,211
313 4,451,212
366 4,451,213

CLASS 418

11 4,451,214
23 4,451,215
61 B 4,451,216
69 4,451,217
137 4,451,218
138 4,451,219
255 4,451,220

CLASS 419

33 4,451,429

CLASS 420

464 4,451,639
492 4,451,430
588 4,451,431

CLASS 422

63 4,451,433
102 4,451,434
171 4,451,435
186.29 4,451,436

CLASS 423

3 4,451,437
20 4,451,438
55 4,451,439
112 4,451,440
213.2 4,451,441
224 4,451,442
432 4,451,443
480 4,451,444
645 4,451,445

CLASS 424

1.1 4,451,450
4,451,451
78 4,451,452
81 4,451,453
92 4,451,446
127 4,451,454
131 4,451,447
177 4,451,455
4,451,456
180 4,451,457
183 4,451,458
195 4,451,459
238 4,451,460
246 4,451,461
248.55 4,451,462
249 4,451,463
251 4,451,448
4,451,464
4,451,465
4,451,466
4,451,467
253 4,451,449
256 4,451,468
4,451,473
260 4,451,470
263 4,451,469
4,451,471
4,451,472
266 4,451,474
270 4,451,475
272 4,451,476
273 N 4,451,477
273 P 4,451,479
273 R 4,451,478
278 4,451,480
279 4,451,481
284 4,451,482
285 4,451,483
305 4,451,484
316 4,451,485
317 4,451,486

CLASS 425

8 4,451,221
432 4,451,222
458 4,451,223
548 4,451,224

CLASS 426

89 4,451,488
254 4,451,489
553 4,451,490
555 4,451,491
564 4,451,492
602 4,451,493
649 4,451,494

CLASS 427

27 4,451,495
31 Re.31,590
34 4,451,496
38 4,451,498
4,451,499
4,451,500
39 4,451,497
40 4,451,501
48 4,451,502
53.1 4,451,503
54.1 4,451,509
64 4,451,504
98 4,451,505
239 4,451,506
240 4,451,507
423 4,451,508

CLASS 428

8 4,451,510
35 4,451,511
36 4,451,512
71 4,451,514
112 4,451,515
116 4,451,516
4,451,517
137 4,451,518
167 4,451,519
198 4,451,520
199 4,451,521
201 4,451,522
209 4,451,523
213 4,451,524
4,451,525
216 4,451,526
220 4,451,527
287 4,451,528
319.3 4,451,529
323 4,451,530
329 4,451,531
4,451,535
336 4,451,532
337 4,451,533
372 4,451,534
383 4,451,536
391 4,451,537
447 4,451,538
515 4,451,539
615 4,451,540
658 4,451,541

CLASS 429

174 4,451,542
206 4,451,543

CLASS 430

5 4,451,544
59 4,451,545
69 4,451,546
79 4,451,548
128 4,451,547
134 4,451,549
176 4,451,550
270 4,451,551
302 4,451,552
306 4,451,553
313 4,451,554
346 4,451,556
445 4,451,555
505 4,451,557
546 4,451,558
552 4,451,559
567 4,451,560
619 4,451,561

CLASS 431

14 4,451,225
15 4,451,226
18 4,451,227
76 4,451,228
253 4,451,229
284 4,451,230

CLASS 432

13 4,451,231
103 4,451,232
224 4,451,233

CLASS 433

54 4,451,234
201 4,451,235
207 4,451,236
225 4,451,237

CLASS 435

2 4,451,562
21 4,451,563
55 4,451,564
117 4,451,565
162 4,451,566
170 4,451,567
181 4,451,568
183 4,451,487
188 4,451,569
240 4,451,570

CLASS 436

505 4,451,571

CLASS 440

75 4,451,238

CLASS 441

66 4,451,239
129 4,451,240

CLASS 445

33 4,451,241
65 4,451,242
68 4,451,243

CLASS 455

260 4,451,930

CLASS 464

68 4,451,244
181 4,451,245

CLASS 493

204 4,451,249
215 4,451,246

CLASS 494

52 4,451,247
84 4,451,248
85 4,451,250

CLASS 502

62 4,451,572
113 4,451,573
115 4,451,574
122 4,451,575
155 4,451,576
167 4,451,577
303 4,451,578
306 4,451,579
335 4,451,580

CLASS 521

28 4,451,581
38 4,451,582
49.5 4,451,583
54 4,451,584
59 4,451,585
88 4,451,586
171 4,451,587
175 4,451,588

CLASS 523

124 4,451,589
155 4,451,590
177 4,451,591
206 4,451,592
322 4,451,593
336 4,451,594
351 4,451,595
501 4,451,59o

CLASS 524

39 4,451,597
69 4,451,598
169 4,451,599
196 4,451,600
263 4,451,601
266 4,451,602
279 4,451,603
312 4,451,604
423 4,451,605
445 4,451,606
494 4,451,607
560 4,451,608
708 4,451,609

CLASS 525

19 4,451,610
51 4,451,611
53 4,451,612
54.31 4,451,613
80 4,451,614
98 4,451,615
178 4,451,616
203 4,451,617
349 4,451,618
379 4,451,619
398 4,451,620
426 4,451,621
456 4,451,622
505 4,451,623

CLASS 526

62 4,451,625
122 4,451,626
192 4,451,627
225 4,451,628
238.23 4,451,629
261 4,451,630
287 4,451,631
292.2 4,451,624
317 4,451,632
348.6 4,451,633

CLASS 528

24 4,451,634
71 4,451,635
75 4,451,636
115 4,451,637
205 4,451,638
265 4,451,640
295.5 4,451,641
347 4,451,642
387 4,451,643
388 4,451,644
391 4,451,645
401 4,451,646

CLASS 536

21 4,451,647
54 4,451,648
111 4,451,649

CLASS 544

105 4,451,650
221 4,451,651
229 4,451,652
238 4,451,653

CLASS 546

34 4,451,654
85 4,451,655

CLASS 548

352 4,451,656
456 4,451,657
461 4,451,402
562 4,451,658

CLASS 549

4 4,451,659
63 4,451,660
417 4,451,661
462 4,451,662

CLASS 560

29 4,451,663
86 4,451,664
202 4,451,665
204 4,451,666
207 4,451,667
246 4,451,668

CLASS 562

442 4,451,669
606 4,451,670

CLASS 564

286 4,451,671

CLASS 568

384 4,451,672
454 4,451,673
539 4,451,674
726 4,451,675
780 4,451,676
881 4,451,677
902 4,451,678
909 4,451,679
4,451,680
932 4,451,681

CLASS 570

142 4,451,682
224 4,451,683

CLASS 585

329 4,451,684
415 4,451,685
444 4,451,686
489 4,451,687
524 4,451,688
525 4,451,689

CLASS 604

24 4,451,251
43 4,451,252
60 4,451,253
62 4,451,254
119 4,451,257
157 4,451,255
164 4,451,256
333 4,451,258
408 4,451,259
890 4,451,260

CLASSIFICATION OF DESIGNS

D2—	361	274,015
	415	274,016
	422	274,017
D4—	25	274,018
D6—	4	274,019
	12	274,020
	31	274,021
	69	274,022
	86	274,023
	95	274,024
	99	274,025
		274,026
		274,027
D7—	308	274,028
	309	274,029
	391	274,030
	398	274,031
D8—	55	274,032
	71	274,033
	72	274,034
	316	274,035
	370	274,036
	373	274,037
	382	274,038
D9—	323	274,039
	339	274,040
	434	274,041
D10—	18	274,042
	50	274,043
	74	274,044
		274,045
		274,046
		274,047
	106	274,048
	116	274,049
D12—	110	274,052
	126	274,053
	146	274,051
	187	274,054
	300	274,050
D14—	11	274,055
	33	274,056
		274,057
	34	274,058
	54	274,059
	68	274,060
	94	274,061
D15—	27	274,062
	30	274,063
D17—	21	274,064
D19—	78	274,065
	92	274,066
		274,067
D21—	57	274,069
	59	274,070
	63	274,072
	107	274,073
		274,074
	149	274,071
	150	274,075
	191	274,076
	230	274,077
	238	274,078
D22—	7	274,079
	30	274,080
		274,081
D23—	21	274,082
		274,083
	30	274,084
		274,085
		274,086
		274,087
	77	274,088
D24—	8	274,089
	26	274,090
		274,091
		274,092
		274,093
		274,094
		274,095
	27	274,096
	34	274,097
		274,098
D25—	38	274,006
	55	274,004
	87	274,005
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